TECHNOLOGY DEPT.

INDIA RUBBER WORLD

OUR 62nd YEAR

A BILL BROTHERS PUBLICATION

JULY, 1951

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DETROIT

Just as Tanks require Bogie Wheels for Support,



Bogie Wheels require..

STERLING SO

FOR
- LOW HEAT BUILD-UP
- LASTING RESILIENCE
- GOOD PROCESSING

CABOT

GODFREY L. CABOT, INC.

Manufacturers find DU PONT THIONEX-MBTS ACCELERATION is best for "cold rubber" treads and camelback

Here are the advantages tire and camelback manufacturers found in tests comparing Thionex-MBTS combinations with their regular-production accelerator. They proved to themselves Thionex-MBTS acceleration is unexcelled in "cold rubber" stocks containing fine furnace blacks.

TREAD WEAR—Tests proved that the treads of tires containing Thionex-MBTS combinations wore fully as well as the treads of the control tires.

TREAD CRACKING—Treads accelerated with Thionex-MBTS showed no evidence of crack growth during test runs of as long as 43,000 miles.

PROCESSING SAFETY—Actual factory experience showed that stocks accelerated with Thionex-MBTS were very safe processing. Mooney scorch times of 30 minutes are typical of "cold rubber" treads and camelback compounds containing Thionex-MBTS acceleration.

STORAGE STABILITY—Camelback manufacturers appreciate the storage stability of stocks containing Thionex-MBTS. Unlike compounds containing some types of accelerators, stocks using Thionex-MBTS acceleration do not lose curing strength nor do they "set-up" after prolonged storage.

COST—The use of Thionex-MBTS acceleration saved money . . . was 40-50% lower in cost than their regular-production accelerators.

● **For complete information on Thionex-MBTS Acceleration, see Report BL 235. Extra copies are available from your District Office.**

BRANCH OFFICES:

Akron, Ohio	40 E. Buchtel Ave.	HEmlock 3161
Boston, Mass.	140 Federal St.	HAncock 1711
Chicago, Ill.	7 S. Dearborn St.	ANdover 3-7000
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DU PONT RUBBER CHEMICALS

E. I. du Pont de Nemours & Co. (Inc.), Wilmington 98, Del.

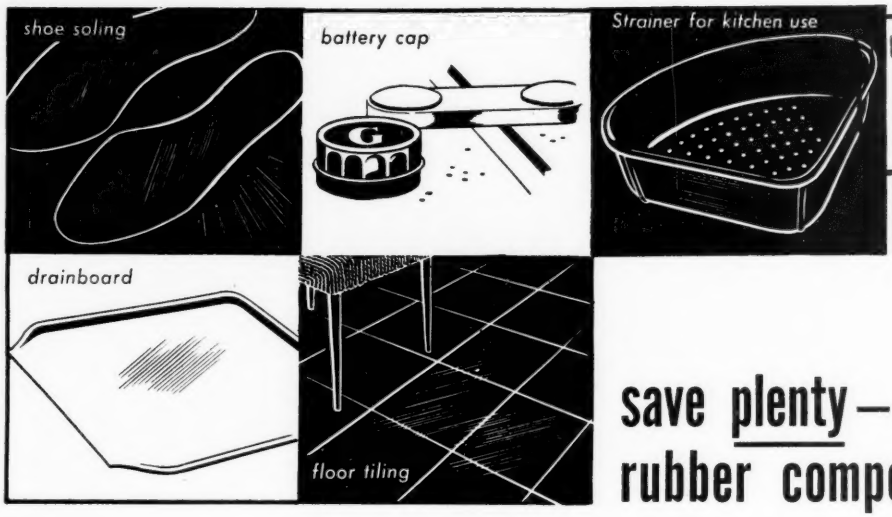
DU PONT

BETTER THINGS FOR BETTER LIVING . . . THROUGH CHEMISTRY

INDIA RUBBER WORLD, July, 1951, Vol. 124, No. 4. Published Monthly by BILL BROTHERS PUBLISHING CORP., Office of Publication, Orange, Conn., with Editorial and Executive Offices at 386 Fourth Avenue, New York 16, N. Y., U.S.A. Entered as Second Class Matter at the Post Office at Orange, Conn., under the act of March 3, 1879. Subscription United States and Mexico, $3.00 per year; Canada $4.00; All Other Countries $5.00; Single Copies 35 Cents. Address Mail to N.Y. Office.

News about

B. F. Goodrich Chemical Company *raw materials*



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save plenty—get improved rubber compounding, too!

...with Good-rite RESIN 50

HERE'S an easy-processing, reinforcing agent that cuts rubber compounding costs—and helps you get improved finished products.

First big advantage of Good-rite Resin 50 is that it provides a new and simple compounding approach to hardness problems. As an example—it's a means of filling in the gap between soft rubber compounds and ebonites.

Good-rite Resin 50 brings *more* advantages. It saves time by eliminating masterbatching. Your rubber compounds gain better flex life, higher elongation, improved abrasion resistance. They are more easily handled because Resin 50 acts as a plasticizer at processing temperatures.

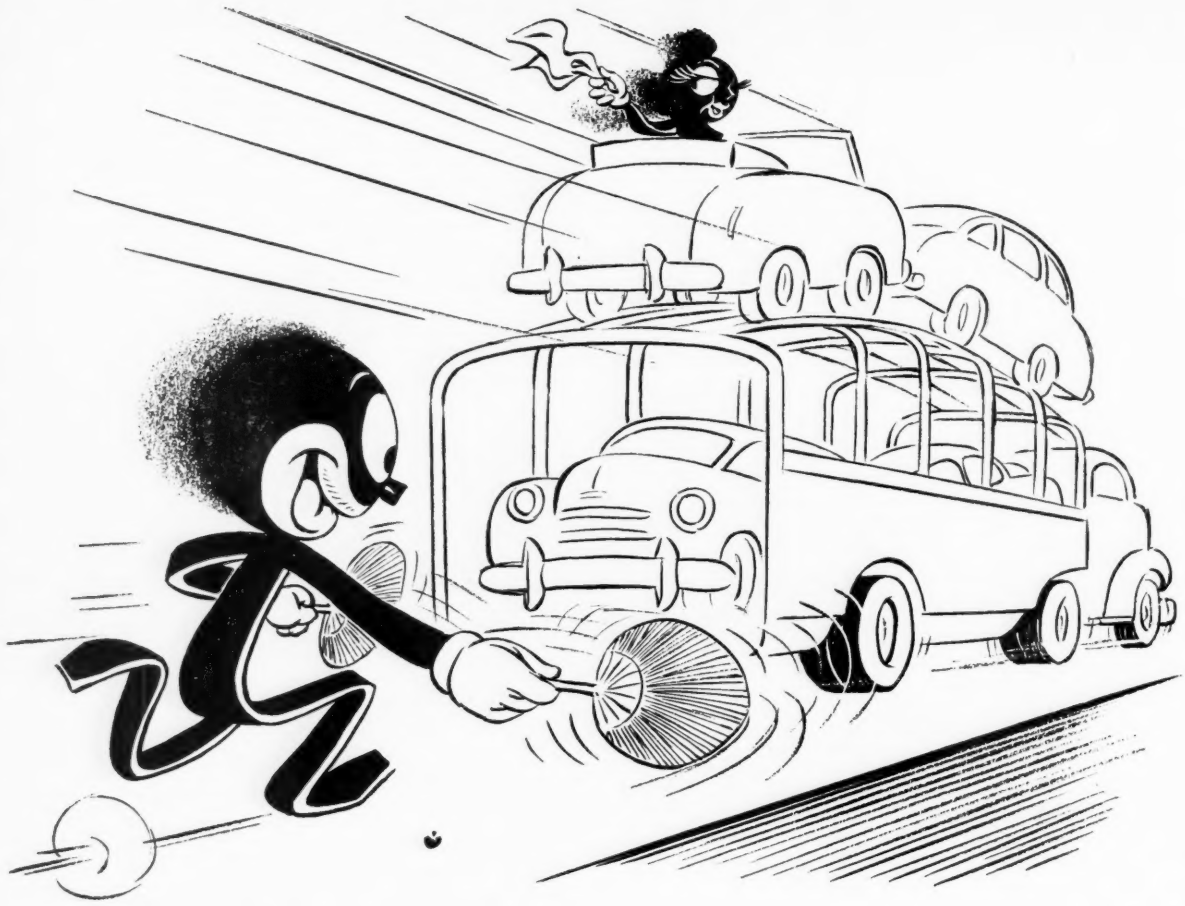
For extruded shapes such as gaskets, tubing, coving, etc., especially on hard compounds, Resin 50 provides improved surface smoothness and superior processing characteristics in the extruder.

A white, free-flowing powder, Good-rite Resin 50 can be compounded in a wide range of colors. Send for technical information. Find out how Good-rite Resin 50 can give you *better* results at *lower* costs. Just write Dept. CB-4, B. F. Goodrich Chemical Company, Rose Building, Cleveland 15, Ohio. Cable address: Goodchemco.

B. F. Goodrich Chemical Company
A Division of The B. F. Goodrich Company

Hycar Reg. U. S. Pat. Off.
American Rubber

GEON polyvinyl materials • HYCAR American rubber • GOOD-RITE chemicals and plasticizers • HARMON organic colors



Philblack* A *is the fellow who'll Keep those tires running cool!*

When it comes to dissipating internal heat in heavy duty truck, bus and aircraft tires, Philblack A rates "A-1."

Philblack A stocks tube smoothly, too. Much of the resilience and pliancy of the uncured stock is retained after vulcanization. Thus, Philblack A is clearly indicated for heavy duty tubes as well as for tire carcass stocks.

The Philblack Sales Service Laboratory located in downtown Akron, is adequately staffed and equipped to analyze your compounding needs. Avail yourself of this service through the Philblack technical sales representative who calls on you.

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PHILBLACK SALES DIVISION

EVANS BUILDING · AKRON 8, OHIO

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* A Trademark

Philblack A and Philblack O are manufactured at Borger, Texas. Warehouses in Akron, Boston, Chicago and Trenton.
West Coast agent: Harwick Standard Chemical Company, Los Angeles. Canadian agent: H. L. Blachford, Ltd., Montreal and Toronto.

when the heat is on your rubber products... specify

Aminox

NAUGATUCK

An Antioxidant for Natural, General Purpose, or Special Synthetic Rubbers, Protecting against Heat and Oxygen Aging.

Typical of this Protection are the Following Data on Heat-Resistant Neoprene Compound.

PROTECTION AGAINST HEAT

16 days at 250° F in Air)

	Blank	Plus 2% Aminox
Percent Tensile Retained	**79.2**	**92.6**
Percent Elongation Retained . . .	**21.9**	**36.4**

PROTECTION AGAINST OXIDATION

(13 days in Oxygen Bomb at 80° C-300 p.s.i.)

	Blank	Plus 2% Aminox
Percent Tensile Retained	**59.8**	**73.4**
Percent Elongation Retained . . .	**34.1**	**62.4**

ESPECIALLY RECOMMENDED FOR Tubes, Tire Carcass, Footwear, Belt Frictions, Compounded Latices

PROCESS • ACCELERATE • PROTECT with NAUGATUCK CHEMICALS

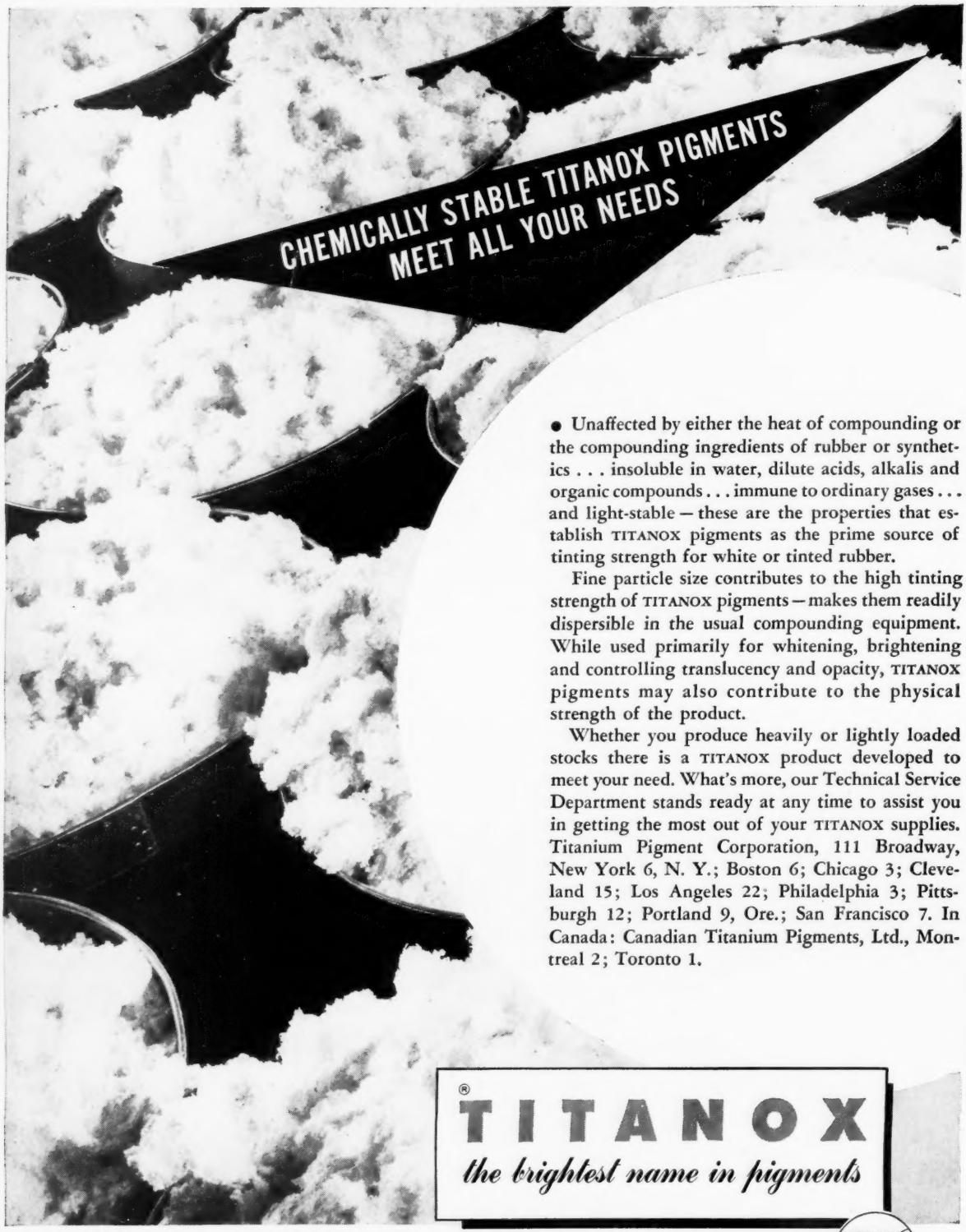
Naugatuck Chemical Division of **United States Rubber Company**

NAUGATUCK, CONNECTICUT

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Rubber Chemicals • Aromatics • Synthetic Rubber • Plastics • Agricultural Chemicals • Reclaimed Rubber • Latices

FOR WHITENING OR TINTING RUBBER PRODUCTS



● Unaffected by either the heat of compounding or the compounding ingredients of rubber or synthetics . . . insoluble in water, dilute acids, alkalis and organic compounds . . . immune to ordinary gases . . . and light-stable — these are the properties that establish TITANOX pigments as the prime source of tinting strength for white or tinted rubber.

Fine particle size contributes to the high tinting strength of TITANOX pigments — makes them readily dispersible in the usual compounding equipment. While used primarily for whitening, brightening and controlling translucency and opacity, TITANOX pigments may also contribute to the physical strength of the product.

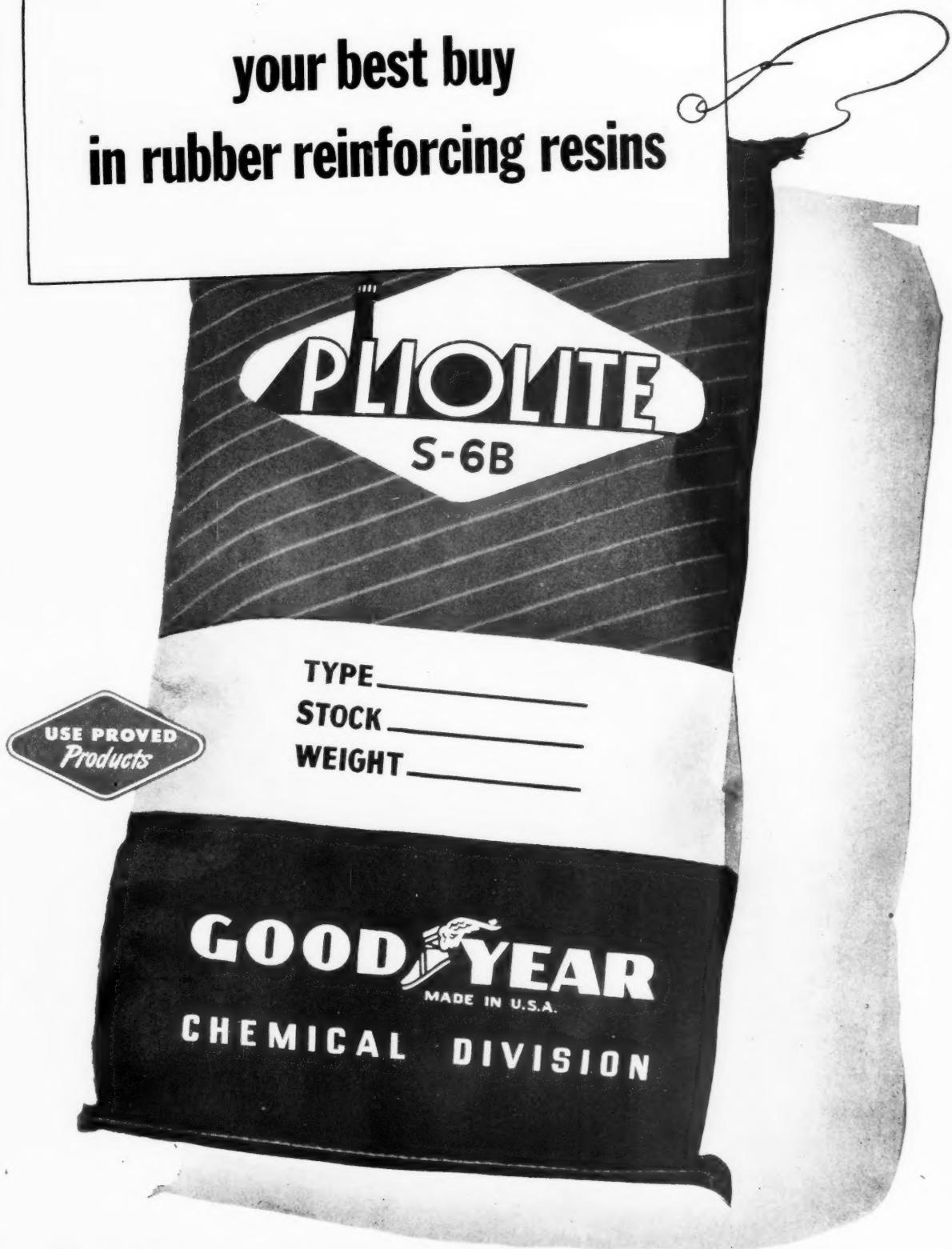
Whether you produce heavily or lightly loaded stocks there is a TITANOX product developed to meet your need. What's more, our Technical Service Department stands ready at any time to assist you in getting the most out of your TITANOX supplies. Titanium Pigment Corporation, 111 Broadway, New York 6, N. Y.; Boston 6; Chicago 3; Cleveland 15; Los Angeles 22; Philadelphia 3; Pittsburgh 12; Portland 9, Ore.; San Francisco 7. In Canada: Canadian Titanium Pigments, Ltd., Montreal 2; Toronto 1.

® TITANOX
the brightest name in pigments

TITANIUM PIGMENT CORPORATION
Subsidiary of NATIONAL LEAD COMPANY

9184

your best buy
in rubber reinforcing resins



The Goodyear Tire & Rubber Company, Inc., Chemical Division, Akron 16, Ohio

Pliolite—T. M. The Goodyear Tire & Rubber Company, Akron, Ohio

Wire Your Reservation NOW

SAVE VITAL PRODUCTION TIME WITH OUR EXPERT

"PRE-PLAN"

BANBURY REBUILDING SERVICE

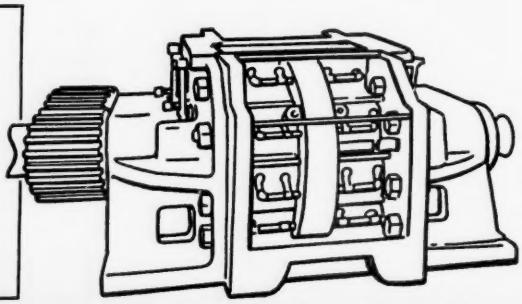
It is costly for any Plant to operate a worn, leaky Banbury: — costly in lost materials, imperfect blending, and retarded production. And, too, there is the serious risk of a complete breakdown.

You will find it profitable in every way to have us put your Banbury body in tip top condition. Our own "Pre-Plan" service saves you weeks of production time . . . gets your Mixer thoroughly rebuilt and back in your line faster. Our facilities handle every size and type of Banbury, and each job is guaranteed.

Wire or write us for a reservation now. Place your valuable mixer body only in the qualified hands of veterans and specialists in Banbury rebuilding. Interstate Service has been perfected through more than sixteen years' experience. Estimates gladly furnished.

SPARE BODIES AND PARTS

We have for sale or interchange Banbury bodies in both spray and jacketed types, and we can also supply parts for most sizes. Tell us your requirements.



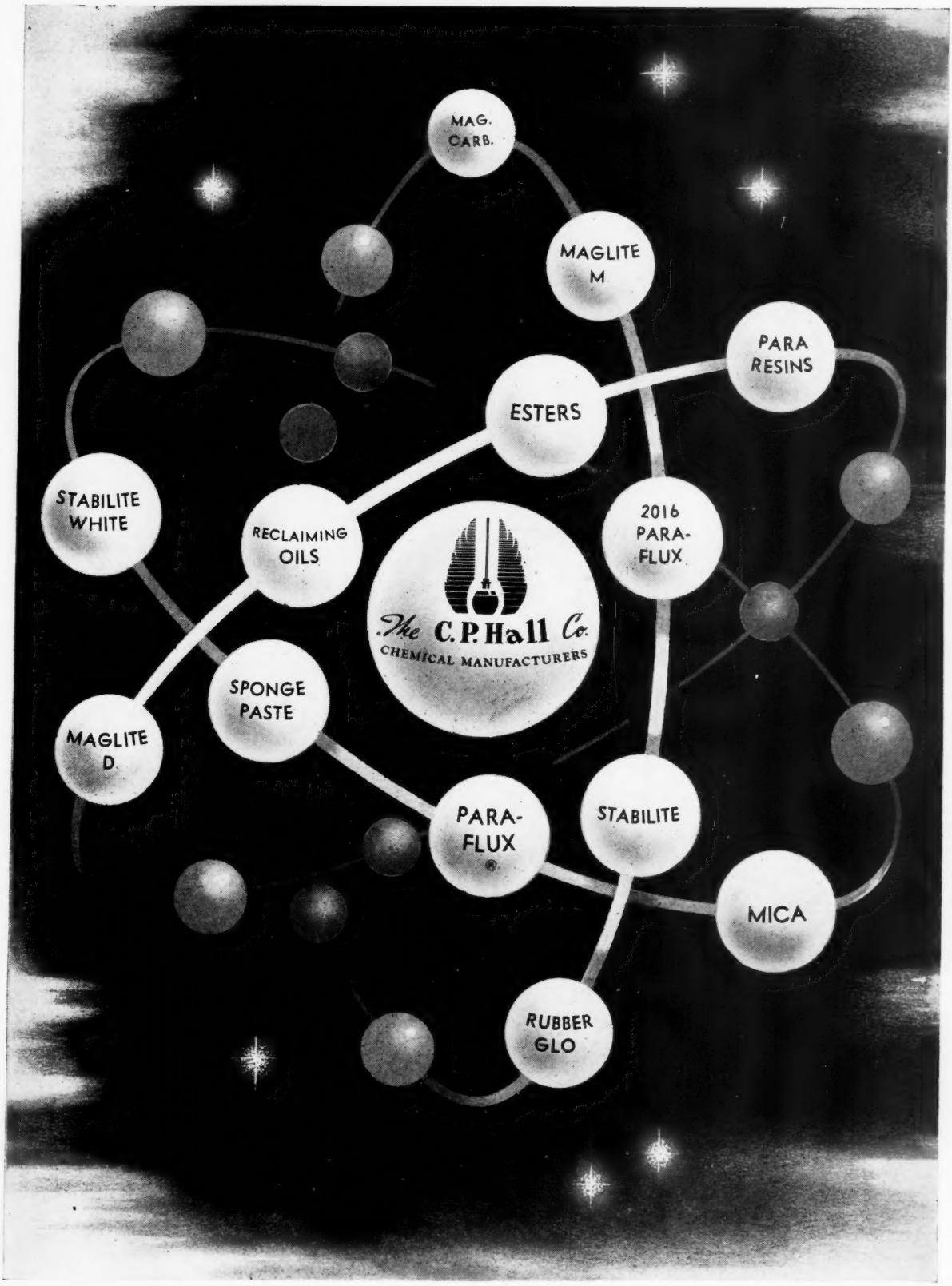
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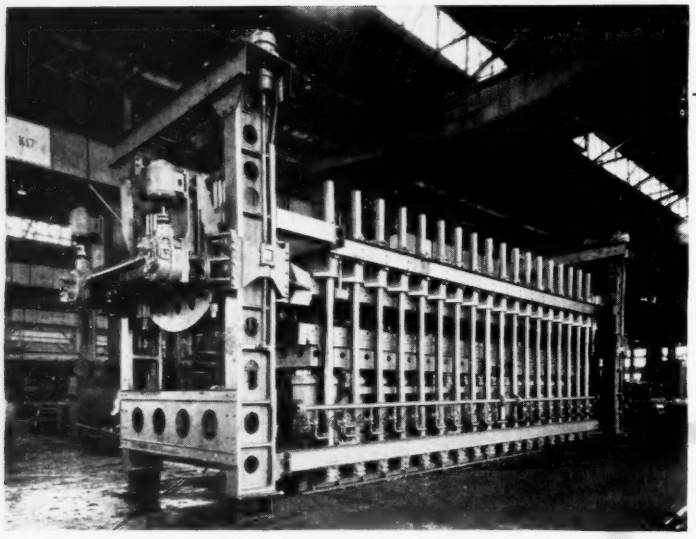


AKRON, OHIO ● LOS ANGELES, CALIF. ● CHICAGO, ILL. ● NEWARK, N. J.

The world's LARGEST

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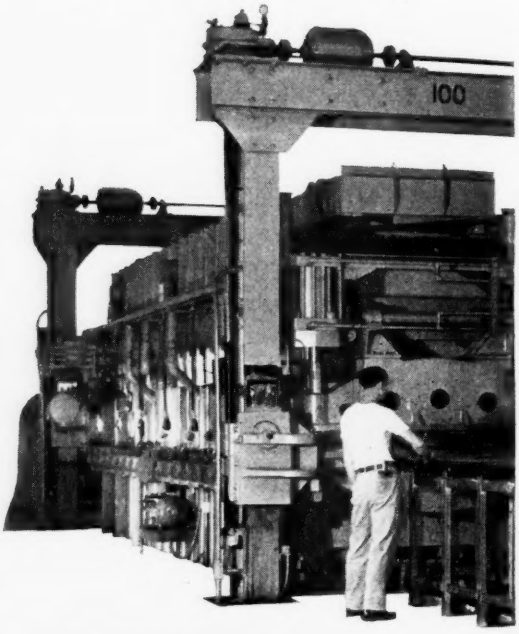


Shop view of Baldwin belt press. Moving platen weighs 38 tons. Unusual feature is temperature control; temperature variation is less than $\pm 3^{\circ}$ over entire platen area, assuring uniform curing.

Conveyor belts have become a vital link in the Nation's industrial transport system . . . and B. F. Goodrich has been a pioneer in extending their use by making the belting ever bigger and better.

This has called for continuing developments in the size and performance of

World's largest single roll of conveyor belting during production on a Baldwin press in the B. F. Goodrich Company plant at Akron, Ohio.



The world's largest single roll of belting 15 feet in diameter, ready for crating and shipping on a special railroad car. Belt is 48-inches wide, and weighs 45,000 pounds.



EDDYSTONE DIVISION
BALDWIN-LIMA-HAMILTON CORP.
Philadelphia 42, Penna.
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BALDWIN

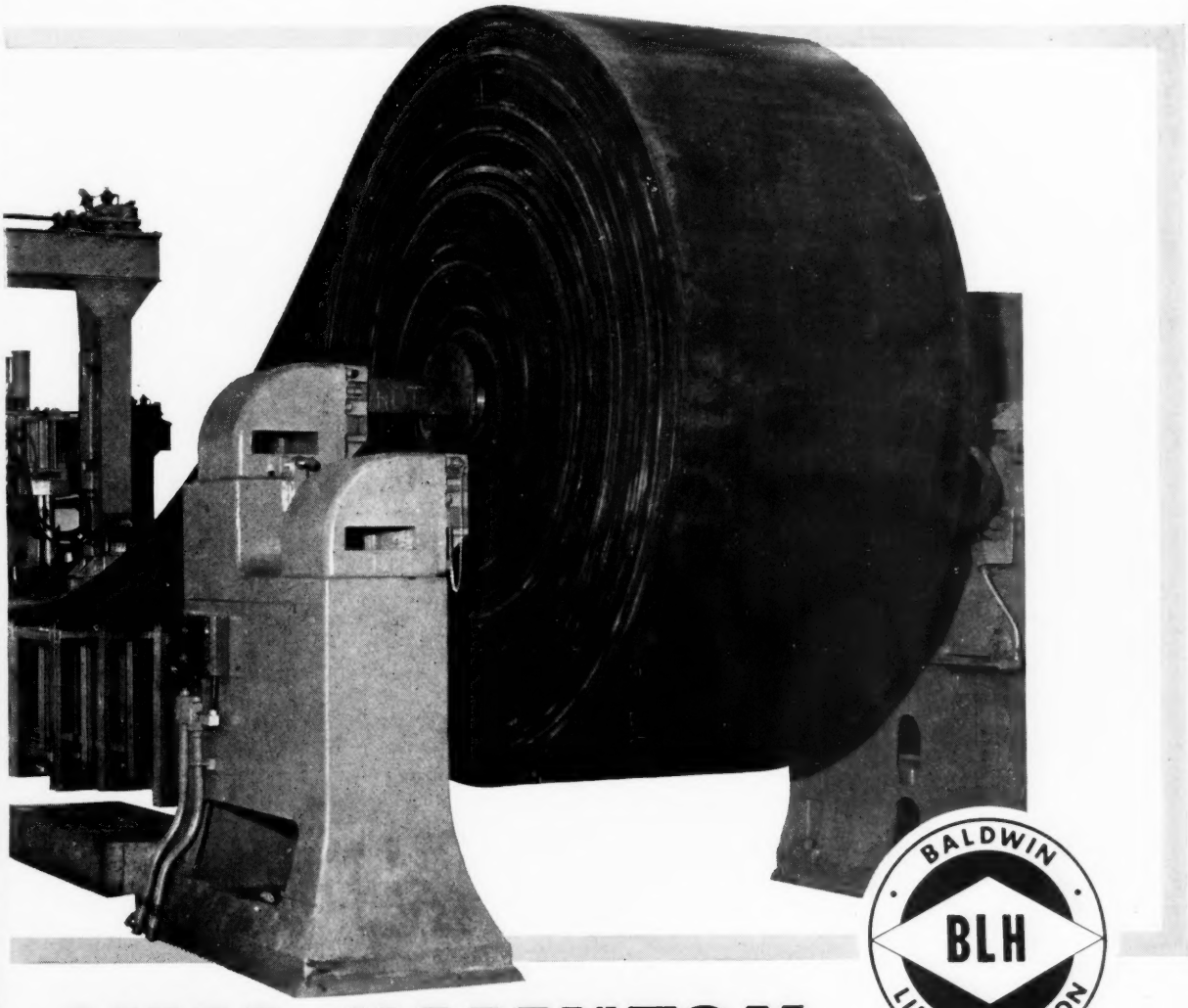
single roll of conveyor belting

B. F. GOODRICH COMPANY

BALDWIN PRESS

belting presses—which is where Baldwin comes in. The experience of years in designing and producing all varieties of presses for the rubber industry played a vital part in converting the designer's plans into a practical, high-production, precision machine. Platen surface is 76″ x 433½″, and a 36-foot section of belting, up to 72-inches wide, can be cured at one time.

The broad know-how of Baldwin-Lima-Hamilton is at your service at all times, for the construction, or development and construction, of all types of standard and special-purpose equipment. A representative will be glad to talk over your problem, and recommend a B-L-H press to solve it.



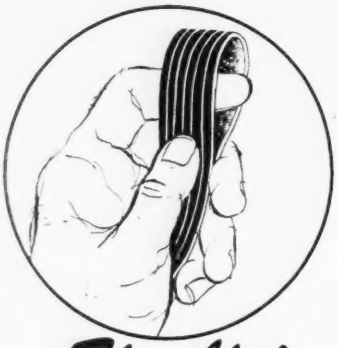
BALDWIN · BLH · LIMA-HAMILTON

-LIMA-HAMILTON

CHANNEL RUBBER



Smooth!



Flexible!



Resilient!

A Typical Extrusion Stock Made From PEQUANOC 3650 Reclaimed Rubber

FORMULA #A-153-3

GR-S	15.0
Pequanoc 3650 Reclaim	30.0
Plasticizing Oil	15.0
H.M.F. Black	15.0
Zinc Oxide	1.0
Stearic Acid	0.5
M.B.T.S.	0.5
D.O.T.G.	0.25
Sulfur	1.0
Paraffin	0.5
Antioxidant	0.25
Soft Clay	21.0
	100.00

PHYSICAL TESTS

Cure, Extruded Rods, Open Steam 40 lbs./ 30 min.

	Unaged	Aged 4 Days Oxygen Bomb
Tensile	1135 lbs./sq. in.	1035 lbs./sq. in.
Elongation	220%	170%
Specific Gravity	1.33	
Shore Hardness	72.	

COSTS

Approx. material cost per lb.	$0.098
Specific Gravity	1.33
Volume Cost	$0.131

For fast, clean extrusion work standardize on 3650 Reclaim.

PEQUANOC

Rubber Company

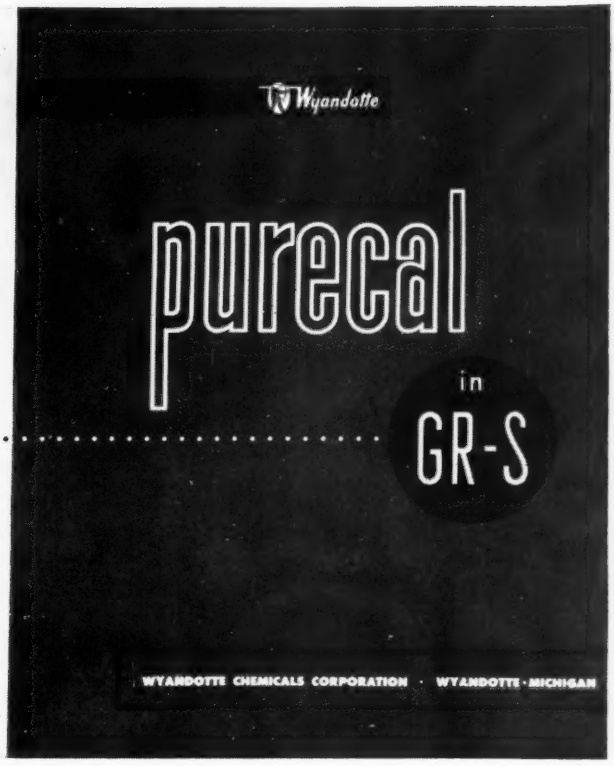
BUTLER, NEW JERSEY

QUALITY RECLAIMS FOR OVER HALF A CENTURY

Manufacturers of Reclaimed Rubber



this book printed on paper coated with PURECAL M



See this new booklet for savings with GR-S

Chances are you've got GR-S on your mind. Well, that's what this new booklet is all about. It's titled "Purecal in GR-S" . . . it's a complete discussion of Purecal* and other non-black fillers in GR-S, compared with carbon blacks.

It gives you the facts on a new GR-S base compound of carbon black quality that can be made with Purecal. And it tells the story of the advantages of this new compound. This booklet is a working tool that offers basic information on the compounding and processing of Purecals in GR-S and cold rubber.

"Purecal in GR-S" is hot off the press and it wouldn't be a bad idea to write for your copy soon.

*Reg. U. S. Pat. Off.

SODA ASH • CAUSTIC SODA • BICARBONATE OF SODA
CALCIUM CARBONATE • CALCIUM CHLORIDE • CHLORINE
HYDROGEN • DRY ICE • SYNTHETIC DETERGENTS • GLYCOLS
CARBOSE (Sodium CMC) • ETHYLENE DICHLORIDE • PROPYLENE
DICHLORIDE • AROMATIC SULFONIC ACID DERIVATIVES
OTHER ORGANIC AND INORGANIC CHEMICALS

WYANDOTTE CHEMICALS CORPORATION
Wyandotte, Michigan • *Offices in Principal Cities*

Wyandotte
REG. U. S. PAT. OFF.

Do your rubber products have the sniff that **sells?**



Use Du Pont **"Alamask"** odorants
TRADE MARK

Give your rubber products more customer appeal with "Alamask" odorants! Often times, it's the sniff that *sells*

Here are some specific—and successful—end uses for new "Alamask" odorants: For rug underlays (natural and synthetic, open or closed cell structure): "Alamask" LD, "Alamask" 6390, "Alamask" O. For blown natural-sponge pillow and mattress stock: "Alamask" O. For shoe adhesives, from natural latex: "Alamask" ND, from synthetic latex: "Alamask" 6337, "Alamask" 175. For rug backings: "Alamask" LD, "Alamask" ND. For natural smoke sheets: "Alamask" O.

Du Pont **"Alamask"** odorants
TRADE MARK

Find out more! Send for the booklet "Odorants for the Rubber Industry"—or ask us for specific recommendations for your individual problems. Write—E. I. du Pont de Nemours & Co. (Inc.), Organic Chemicals Department, Aromatics Section, Wilmington 98, Delaware. Branch Offices: Atlanta, Boston, Charlotte, Chicago, New York, Philadelphia, Providence, San Francisco.

DU PONT
REG. U. S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING . . . *THROUGH CHEMISTRY*



EASIER PROCESSING, *better physical properties and excellent combination of oil and chemical resistance led to the selection of* CHEMIGUM *50 N4NS in the stock from which these pipe fittings were molded to close dimensional tolerances.*

USE PROVED *Products*

You can make better chemically-resistant pipe with CHEMIGUM

Photos courtesy of The Luzerne Rubber Co.



Makers of hard rubber chemical-resistant piping have found that CHEMIGUM — Goodyear's nitrile type synthetic elastomer— is an ideal material. CHEMIGUM has better oil resistance than either natural rubber or other types of synthetics, better physical properties and good moldability.

You'll find that CHEMIGUM rubbers are outstanding in all these characteristics:

Easier Processability
Better Physical Properties
Excellent Chemical Resistance
Excellent Oil Resistance
Excellent Moldability
Fine, Glossy Finish

CHEMIGUM is available in three types — N3NS, with greatest oil and solvent resistance because of its high acrylonitrile content; 30 N4NS, with the lowest Mooney plasticity of any nitrile rubber; and 50 N4NS which is slightly tougher, and best suited for molded applications.

Current uses of the CHEMIGUM rubbers include gasoline hose; oil-resistant shoe soles; hard packing compounds; oil-resistant automotive parts; a wide range of molded and extruded items; and adhesives of several types. Although all nitrile rubbers are currently in short supply, you can find high-potential uses for CHEMIGUM in the future by sending today for samples for evaluation and full technical data to:

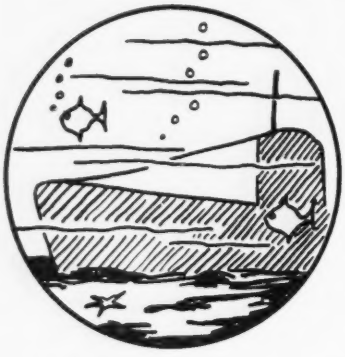
Goodyear, Chemical Division, Akron 16, Ohio

GOODYEAR

Chemigum—T. M. The Goodyear Tire & Rubber Company, Akron, Ohio

1939
100 TH ANNIVERSARY OF THE DISCOVERY OF VULCANIZATION





1939
U.S. SUBMARINE "SQUALUS" SANK

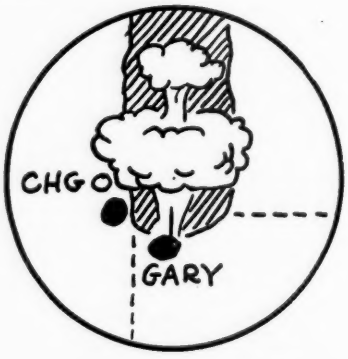
1939
HITLER'S ARMIES INVADED POLAND





1939
BASEBALL'S 100TH ANNIVERSARY

1939
MARBON INTRODUCED **TY-PLY**
TO THE RUBBER TRADE



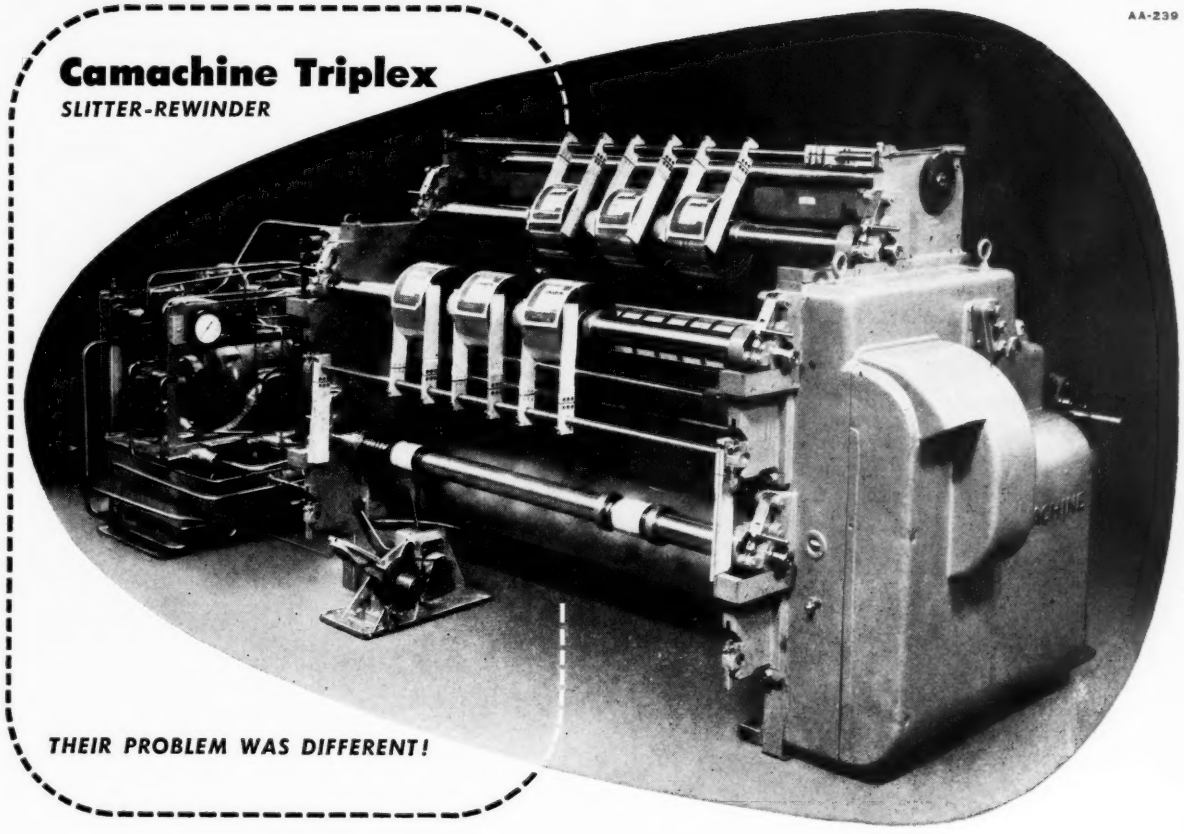
YES! THE RUBBER TO METAL ADHESIVE IS **TY-PLY**
"STOOD THE TEST OF TIME SINCE --'39"

MARBON

MARBON CORP.
GARY INDIANA

AA-239

Camachine Triplex
SLITTER-REWINDER



THEIR PROBLEM WAS DIFFERENT!

when you must depend on experience . . .

A large producer of acetate film ordered a battery of high-speed slitter-rewinders to use in processing their product. Characteristics of the material called for highly sensitive web tension control throughout the slitting and rewinding operation, and for razor-clean slitting. Provision had to be made for producing rolls of uniform density regardless of variations in the caliper of the material. Since core heat would ruin the inner laps of the rewound rolls it was necessary to minimize heat generated by friction between core and rewind shaft. Other requisites included: positive roll separation; trim rewind for salvage; 15″ diameter rewind and speed of 800 feet per minute. And no complicated gadgets — the machines had to be designed for economy, simplicity, durability and low-cost maintenance.

. . . you can depend on Camachines®

The new Camachine Triplex slitter-rewinder was specifically developed to meet the requirements outlined above. The Triplex is a *new* machine, designed to meet a *new* set of operating conditions, and featuring several *new* principles in slitter-rewinder engineering. The Triplex is *new,* yes, but its design is deeply rooted in Cameron Machine Company's sixty years of specialization and leadership in the manufacture of roll production equipment. The new Triplex has proved again that when you have to depend on experience you can depend on Camachines!

For complete information write to:
Cameron Machine Company • 61 Poplar Street • Brooklyn 2, N. Y.

ACTIVATOR NEWS

A supplement to THE ACTIVATOR—the house organ issued by The New Jersey Zinc Company for over 15 years to aid the Rubber Industry in its use of Zinc Oxide.

In BUTYL, too...

PROTOX ZINC OXIDE

...Cuts Power Costs
...Expedites Processing

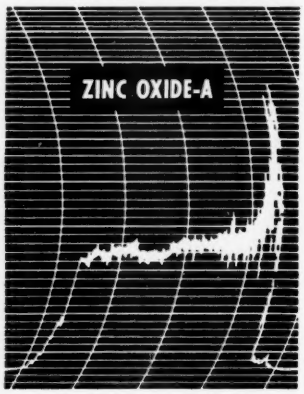
In Butyl, as in GR-S, the easier, better incorporation of Protox-166* in zinc masterbatches helps you in these 2 ways:

1. Eliminates Banbury power peaks—thus cutting penalty payments for electricity beyond the contract demand limit. (See power charts at right.)
2. Reduces strainer "down-time"—as much as 80%—because of fewer undispersed aggregates. (See photographs below.)

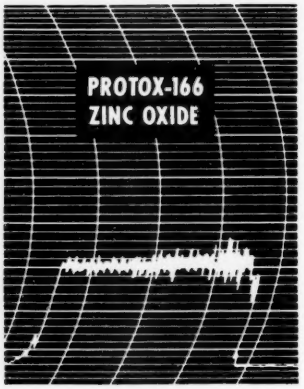
These advantages of Protox stem from its patented coating of zinc propionate, which is readily wetted by Butyl and other types of rubber.

*U. S. Patents 2,303,329 and 2,303,330.

POWER CONSUMPTION CHARTS

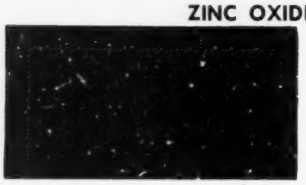


Conventional zinc oxide causes power surges at start of masterbatching.



Protox zinc oxide incorporates without power peaks . . . cuts penalty payments.

ZINC OXIDE DISPERSIONS



ZINC OXIDE-A Conventional zinc oxide gives many undispersed aggregates in the short mixing cycle used here.



PROTOX-166 ZINC OXIDE Protox zinc oxide disperses well, as its special coating is readily wetted by the rubber.

THE NEW JERSEY ZINC COMPANY

Producers of Horse Head Zinc Pigments

... most used by rubber manufacturers since 1852

160 Front Street, New York 38, N. Y.

HORSE HEAD PRODUCTS



Farrel mills can be equipped with remote-controlled strip cutter and roll adjustment for regulating the feed to calender or tubing machine. When actuated by push buttons from the next machine in the line, these motor-operated units will vary the width or thickness of the ribbon of stock being taken from the mill and prevent "choking" or "starving" of the succeeding machine.

For almost a century, Farrel-Birmingham has worked closely with the rubber industry in developing individual processing units to meet the needs of the industry. In addition, the company's *Engineering Planning Division* specializes in the development of complete production layouts. Designed for specific sets of conditions, these installations improve production efficiency and reduce handling costs through planned processing flow.

Write for further details of this unique engineering service or for information about any of the production units listed.

FARREL-BIRMINGHAM COMPANY, INC.
ANSONIA, CONNECTICUT

Plants: Ansonia and Derby, Conn., Buffalo, N. Y.
Sales Offices: Ansonia, Buffalo, New York, Akron, Chicago, Los Angeles, Houston

Farrel-Birmingham®

FB-686

A — Farrel-Birmingham mills are available in a complete range of sizes, from 6" x 13" for the laboratory up to 28" x 84" heavy duty machines for the factory. For special requirements, variations in design as well as a wide choice of drive arrangements are obtainable, often from existing plans. Bulletin 173 describes these machines in detail.

B — Two types of strip cutters are available—hand-operated or motor-operated with push-button control. Two or more knives can be supplied.

F-B PRODUCTION UNITS

Banbury Mixers • Plasticators Pelletizers • Mixing, Grinding, Warming and Sheeting Mills • Bale Cutters • Tubing Machines • Refiners • Crackers • Washers • Calenders • Hose Machines • Hydraulic Presses • and other Equipment for Processing Rubber and Plastic Materials.

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POLYMEL D

(A solid friable styrene-indene copolymer resin)

Highly effective in small quantities

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Excellent moldability

Extender for styrene hardeners and stiffeners

High dielectric properties

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Highly advantageous in GR-S compounding
Excellent processing for all highly loaded batches

Price 23½¢ 1,000 lb. to a carload, 24¢ in less quantities f.o.b. factory

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PELLETEX protects hose tube, friction and cover, makes them stronger and extends their life. PELLETEX compounds maintain a very low water absorption and high resistance to steam, air, oil, gas, gasoline, chemicals, paint, varnish, solvents, animal and vegetable oils or products.

PELLETEX imparts excellent physical and aging properties, and assures a uniform tubing speed that helps compounds to hold their shape during processing. Hose stocks containing PELLETEX extrude smoothly and rapidly, and permit flow into the fabric during vulcanization.

Finished hose made with PELLETEX is pliable and resilient, yet tough enough to withstand rubbing, dragging, and considerably rough treatment. Manufacturers of best hose always specify PELLETEX.

The GENERAL ATLAS Carbon Co.

CABOT

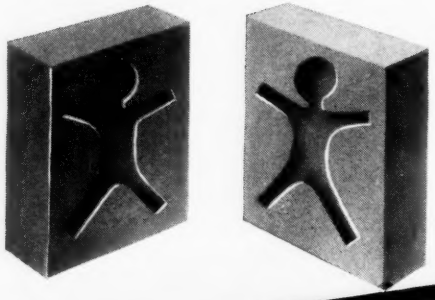
77 FRANKLIN STREET, BOSTON 10, MASS.

Herron Bros. & Meyer Inc., New York and Akron • Herron & Meyer of Chicago, Chicago • Raw Materials Company, Boston
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Relief

FROM A HOST OF "HEADACHES" IN RUBBER MOLDING—





with this improved G-E SILICONE MOLD RELEASE AGENT

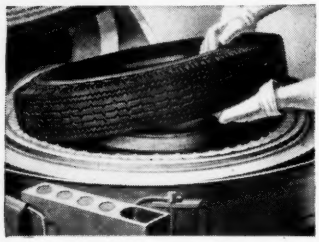
Production records in rubber companies, large or small, tell the remarkable story of General Electric's silicone mold release agent SM-61*. You get fewer rejects . . . reduced mold down time for cleaning . . . more *even* release . . . better products faster . . . as compared with conventional mold release agents! SM-61 is today's leading mold release agent, and here are the reasons why . . . these *proved* advantages with SM-61 . . .

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- **Many Other Advantages**—SM-61 will not stain light-colored stocks, is rust-inhibited, has low toxicity, and gives outstanding performance in numerous other ways.

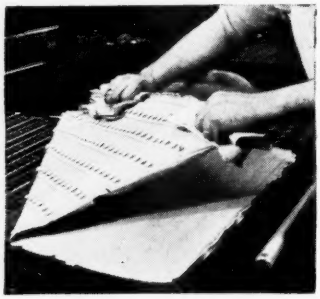
These advantages are all *on the record* of large rubber plants and test laboratories. Why not try SM-61 for yourself? *Chemical Division, General Electric Company, Pittsfield, Massachusetts.*

For details, write to Section P-4, General Electric Company, Waterford, New York. (In Canada: Canadian General Electric Co., Ltd., Toronto.)

*Formerly G-E 81161



Tires are easily released untorn, unscratched—thanks to SM-61, which prevents pocketing.



Smoother finished rubber buttons are obtained through the even release provided by SM-61.

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Flowers of Sulphur, 99½% Pure
(30% Insoluble in CS_2)
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Carbon Bisulphide
Caustic Soda
Sulphur Chloride
Borax

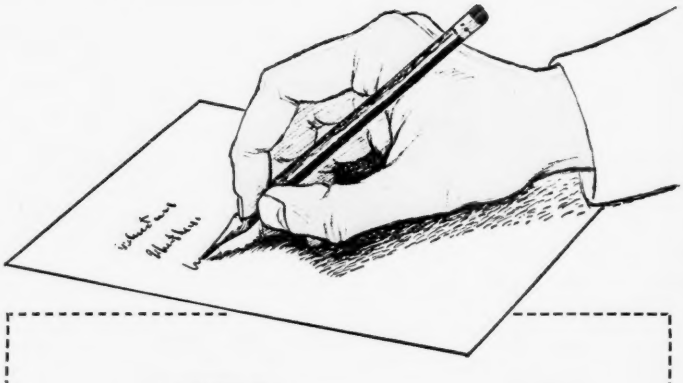
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STAUFFER CHEMICAL COMPANY

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221 North LaSalle Street, Chicago 1, Illinois • 824 Wilshire Boulevard, Los Angeles 14, Cal. 636 California Street, San Francisco 8, Cal. • 424 Ohio Bldg., Akron 8, O. • Apopka, Fla. • N. Portland, Ore. • Houston 2, Tex. • Weslaco, Tex.

STOP... LOOK...and LIST 'EM!



...There may be several types of products that you need in this list of FLINTKOTE materials

Surely, there's at least *one* place in your plant or processes where materials listed on this page can serve you . . . and serve you *better.*

Maybe it's an improved kind of saturant you need. A new adhesive. Or a sizing . . . a protective coating . . . a mastic flooring emulsion . . . or products for waterproofing or dampproofing. The FLINTKOTE Line includes them all . . . and *more.* They're all *quality* products . . . all FLINTKOTE-made.

Maybe you're looking for a *brand new* product. One that improves your plant protection or your manufacturing processes. A *tailor-made* one—that no one else has been able to give you. Our research staff will be glad to help you develop it.

You can get a finished product . . . or one to use as a component in your own formulations.

We manufacture in volume . . . with plants from coast to coast.

So read the list at the right—make *your own* list—and send it to us for complete information, specifications and prices. No obligation, of course—and you'll be mighty glad to have FLINTKOTE as another reliable source of supply.

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Industrial Products Division
30 Rockefeller Plaza, New York 20, N. Y.

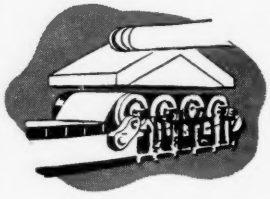
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Asphalt and Rubber Compounds
Solvent Rubber Cements
Synthetic Rubber and Resin Compounds
Rubber and Resin Water Dispersions
Asphalt Tile Cements

SATURANTS and SIZINGS



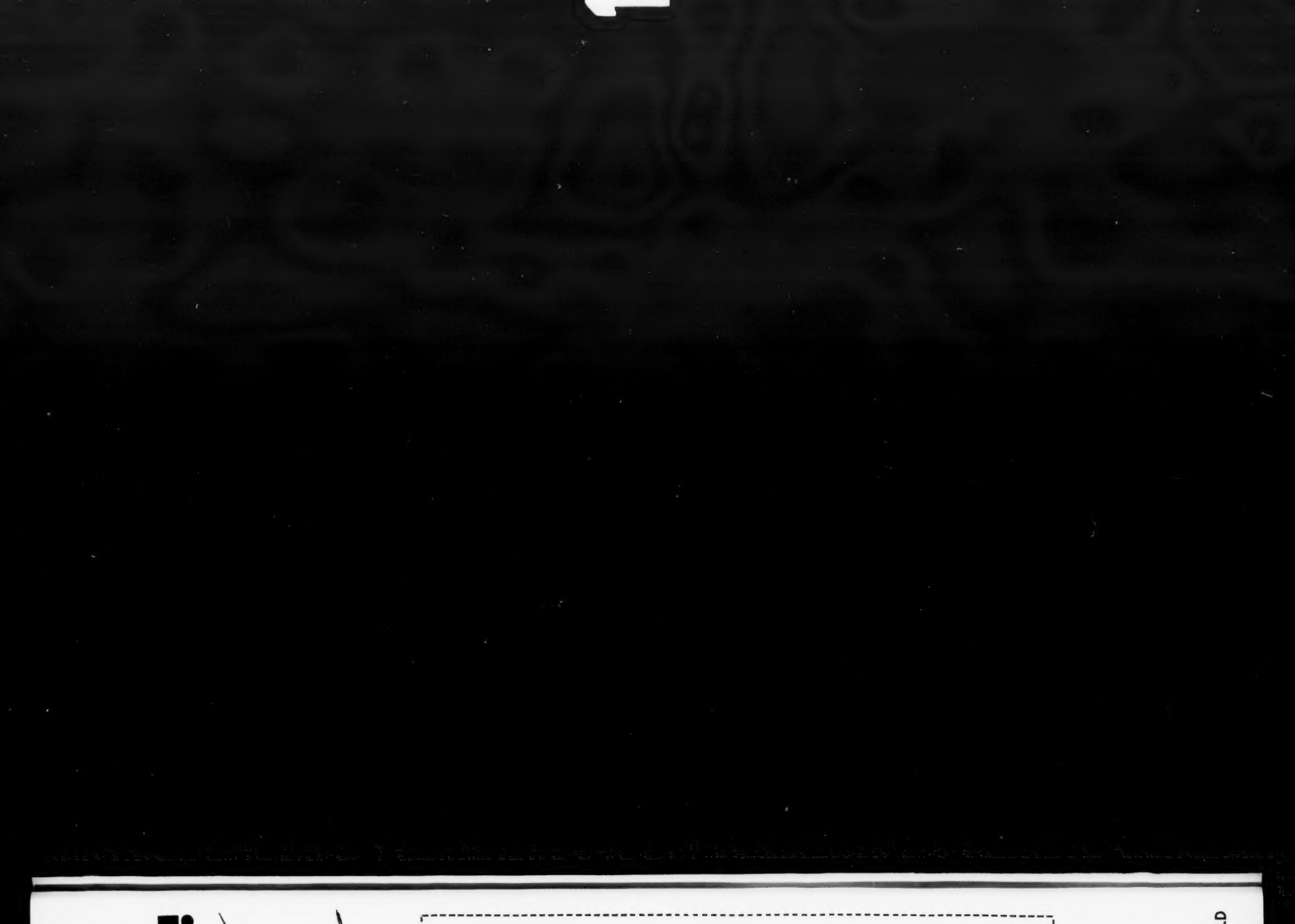
Asphalt Products for Waterproofing paper, cloth, building materials
Rubber Compounds for Carpet Backing and impregnating
Binders for various compositions
Tire Cord Dipping Solutions

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Protection for Thermal Insulation
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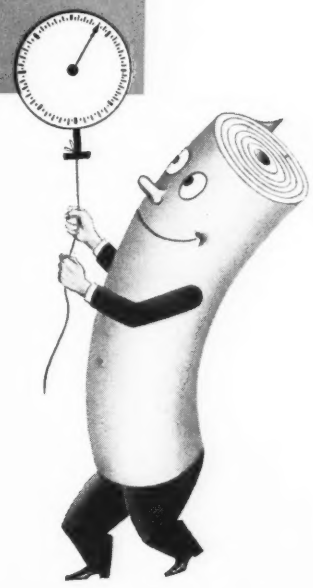
Preference for United blacks is world-wide because they completely satisfy the consumer's exacting demands.

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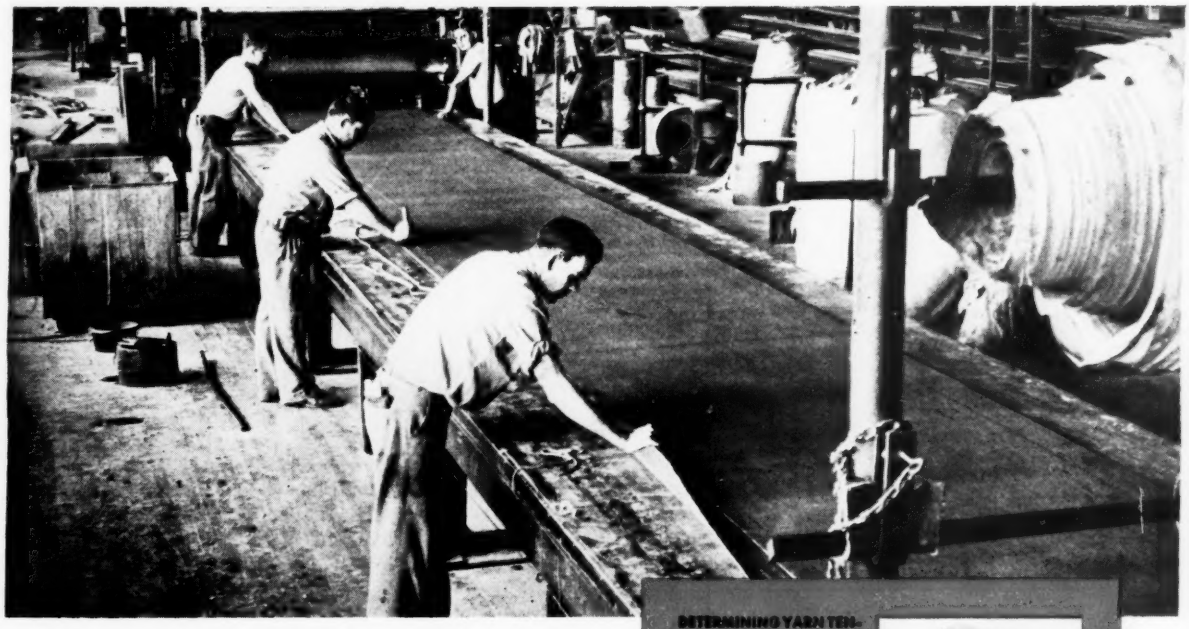
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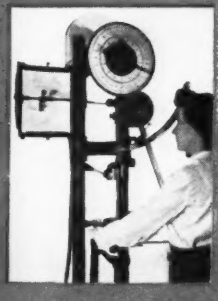
Mt. Vernon-Woodberry's staff of textile engineers is available on request to help you with your problems in development or application of industrial fabrics.



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ALKYLPHENOL SULFIDE

Vulcanizing agent for natural rubber and synthetic elastomers. Vultac eliminates sulfur bloom normally encountered with pigment sulfur, and imparts easy processing characteristics to GR-S formulations.

The uniform vulcanization achieved through the use of the VULTACS results in GR-S and nitrile rubber stocks possessing the following superior qualities:

1. Maintenance of tensile strength and elongation upon extended cure.
2. Retention of tensile strength and elongation after severe aging.
3. Outstanding resistance to heat.
4. Outstanding resistance to flex cracking and tear, before and after aging and at elevated temperatures.

	VULTAC No. 2	VULTAC No. 3
Type Alkylphenol Sulfide	Disulfide	Disulfide
Sulfur Content	23%	28%
Color and Form	Hard Brown Resin	Hard Brown Resin
Softening Point (ASTM E28-36T)	55-65°C.	70-80°C.
Solubility	Readily soluble in all common organic solvents except the alcohols.	Readily soluble in all common organic solvents except the alcohols.
Specific Gravity 25/25°C.	1.16-1.17	1.19-1.20
Approx. Lbs. per Gallon	9.7	10.0

● 25th Anniversary ●

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can a rubber chemist learn from a soap chemist?

PRODUCT	INDUSTRY	USE
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Diglycol Laurate	Paper Textiles	Defoamer Emulsifier
Diglycol Stearate	Cosmetics Paper Metals	Emulsifier Plasticizer Lubricant
Poly Glycol 200 Mono Laurate	Plastics	Viscosity Stabilizer
Poly Glycol 400 Mono Laurate	Insecticides General Plastics	Emulsifier Non-ionic wetting agent Anti-static agent
Poly Glycol 400 Mono Stearate	Textiles Pharmaceuticals	Suspending and thickening agent Suspending agent
Poly Glycol 400 Distearate	Shampoos	Thickener and foam stabilizer
Poly Glycol 600 Mono Laurate	Detergents	Non-ionic surfactant
Carbowax 1000 Mono Stearate	Paper Coating	Anti-gelling agent
Carbowax 1500 Mono Stearate	Pharmaceuticals	Dispersing agent
Carbowax 4000 Mono Stearate	Electrical Insulation Textiles	Water soluble lubricant Thickener

Yes, a rubber chemist can learn a thing or two from a soap chemist about polyhydric alcohol fatty acid esters. The rubber chemist can learn how Polyethylene Glycol 400 Di Laurate and Mono Laurate affect synthetic rubber and resin latices. The soap chemist knows well how the monester is an excellent penetrating and cleansing non-ionic wetting agent capable of improving quality and adding good properties to his products.

Note how the products in the above table change in uses as the molecular weights increase. No matter what kind of chemist you are, Glyco can tell you a thing or two about polyoxymonoesters. Why not send for a copy of our latest Ester Catalog today?



CHEMICALS BY GLYCO

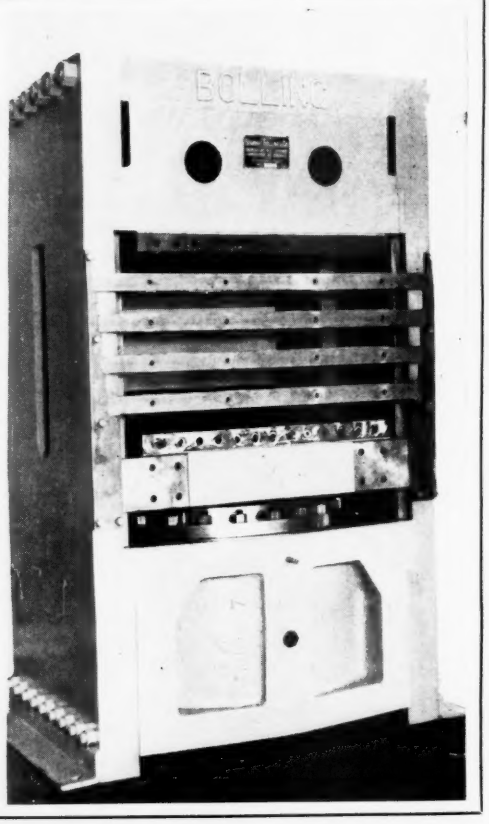
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HYDRAULIC MOLDING PRESSES

HEADQUARTERS SINCE 1924

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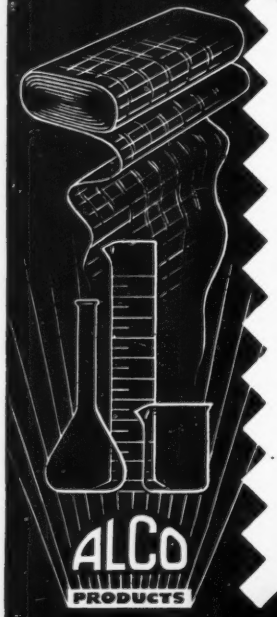
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with better

PIGMENT DISPERSION IN ALL TYPES OF RUBBER STOCKS . . .

PLASTICIZER HSC-13 (LIQUID)

A new, tested plasticizer, HSC-13 offers vital advantages as an aid to mixing and pigment dispersion . . . It cuts down on the mixing cycle and at the same time gives better dispersion, making it possible to increase output . . . HSC-13 will give slightly increased hardness, better flex life, higher elongation and abrasion resistance. It is effective in low grade stocks with high filler content as well as with natural rubber, GR-S, Nitrile or with blends of various rubbers.

PLASTONE (LIQUID or SOLID)

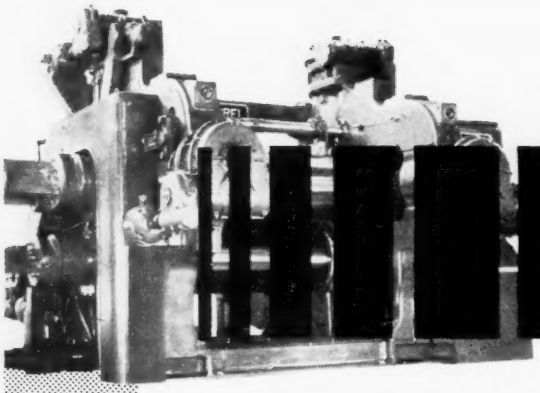
Plasticizer-Peptizer, PLASTONE is non-toxic, practically odorless and does not impart any color to the compound. It greatly improves dispersion of pigments, resistance to abrasion, aging and flex-cracking. Milled and calendered blanks remain firm with minimum shrinkage — an important advantage where automatic cutting of hot stocks is employed . . . PLASTONE smooths out dry, rough stocks, acts as a non-blooming fatty acid, activates thiazole accelerators, reduces viscosity of rubber solutions . . . It has a strong affinity for all types of synthetic, natural and reclaim rubbers.

Write for bulletins giving complete technical data on these plasticizers.

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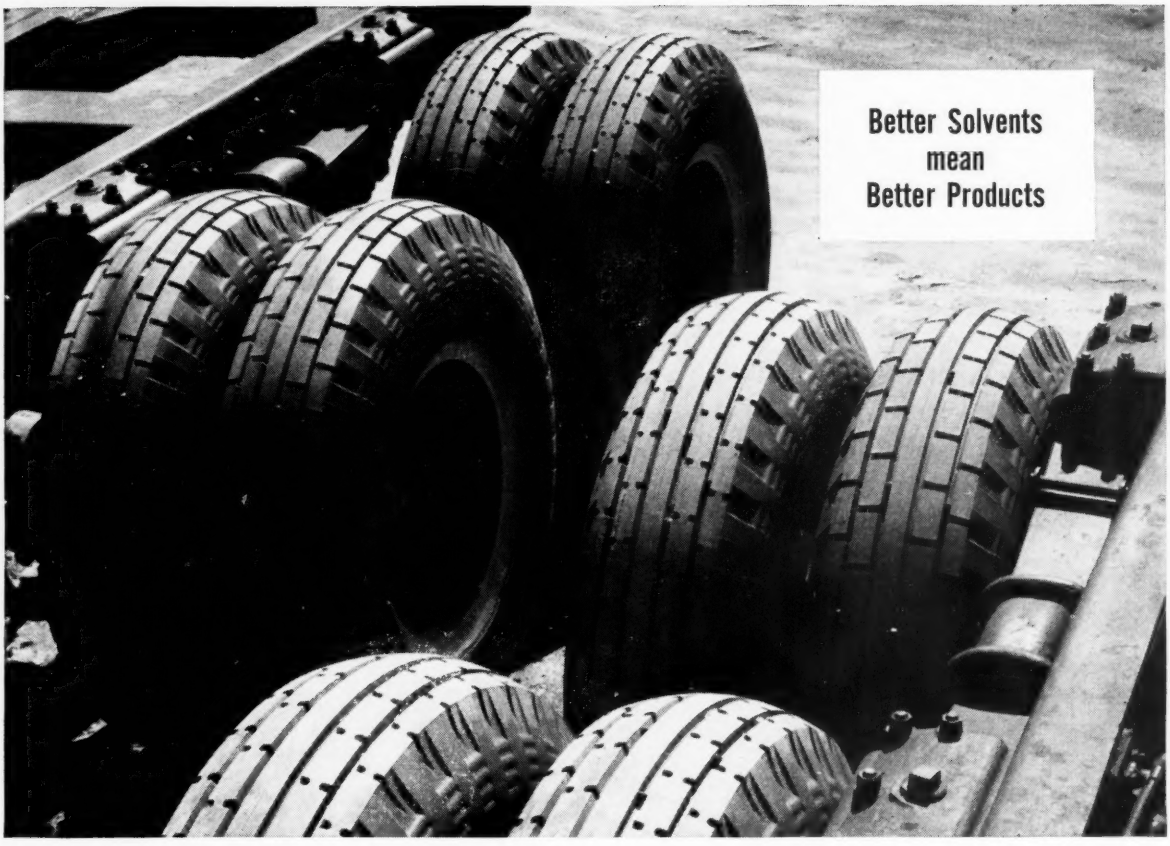
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SKELLYSOLVE H. For general use in manufacturing operations and cements, where faster evaporation rate than that of Skellysolve D is desired.

SKELLYSOLVE E. For use wherever a relatively slow drying solvent is desired.

SKELLYSOLVE R. For general use in tire building and a variety of other manufacturing operations and cements. Reduces evaporation losses. Medium quick final dry. Lessens bloating and skinning tendency.

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Take no chances with the solvent used in your manufacturing operations! Standardize on Skellysolve and be sure you're *right*. When it's Skellysolve, you can be sure of uniformity that helps maintain your product's quality, that helps you hold good customers, that helps to reduce rejects and save rubber.

Analyze Skellysolve's ability to deliver every characteristic you look for! Minimum of low and high boiling compounds means reduced rejects due to blushing and blisters. Controlled vapor pressure means no bloated containers! Minimum of low boiling compounds means no seeds in cements! And freedom from greasy residues means high bonding strength!

Skellysolve is less toxic than some other solvents, reduces health hazards in your plant. Helps boost production, too, because Skellysolve is sweet-smelling, pleasant to work with. It will not freeze at atmospheric temperature, has low end points, quick evaporation, a minimum of unsaturates and pyrogenic decomposition products—every feature that adds up to the almost ideal solvent.

Write for more detailed technical facts.

SKELLY

Skellysolve

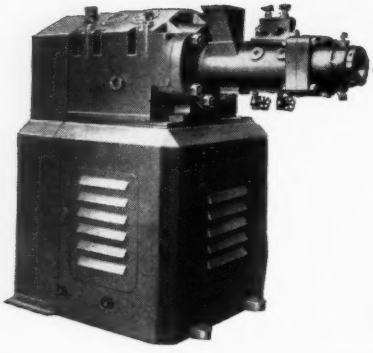
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SHAW



The illustrated shows the latest type of Shaw Extruder. Can be fitted with variable or constant speed motor mounted in the base for cleanliness and to save floor space.

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Here Marvinol is *rigid* and *rugged*—in a fountain pen barrel. There it is *flexible*—in wire covering.

Here are high-style tapestries with a softly woven look and feel. And colorful upholsteries with a *stability* that *holds their shape and fit.* And a snag-free zipper that closes with *no track!*

All these and hundreds more products can be made with Marvinol — rigid as steel, flexible as fabric, crystal clear or opaque, in all colors. In fact, Marvinol can be almost anything *you* want to make it.

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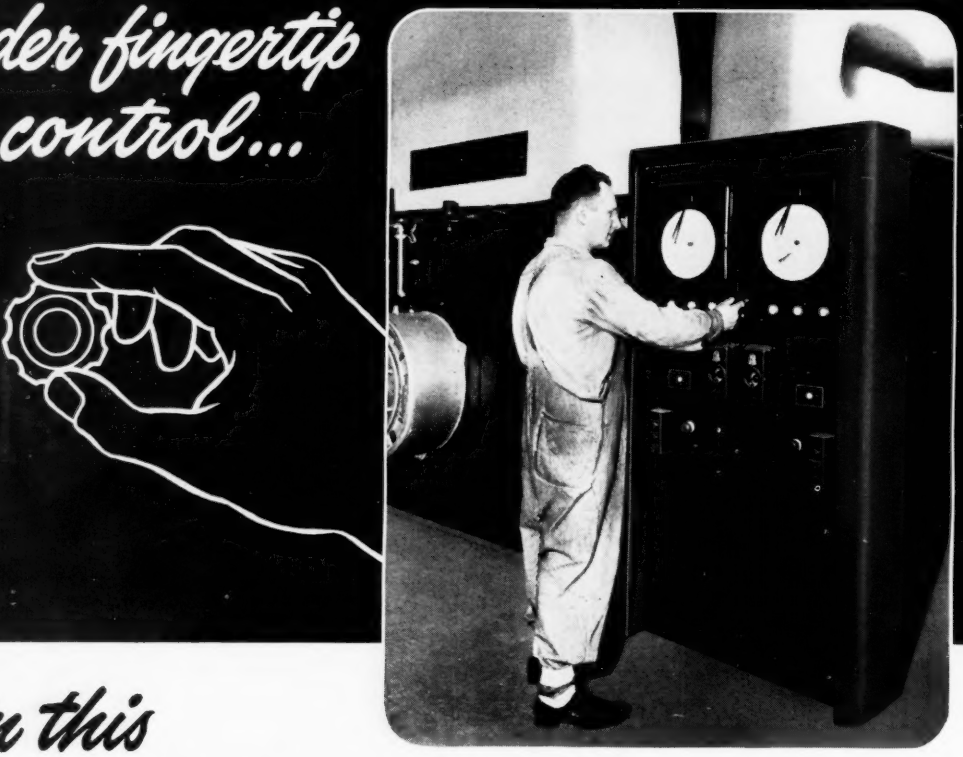
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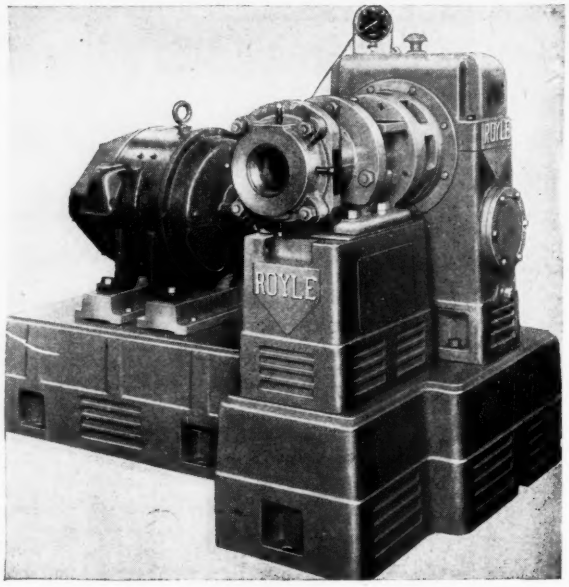
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A Bill Brothers Publication

JULY, 1951
Vol. 124—No. 4

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VOL. 124 — NO. 4 JULY, 1951

The Production and Utilization of High Mooney Viscosity Synthetic Rubber—I[1]

H. D. Harrington,[2] K. V. Weinstock,[2]
N. R. Legge,[3] and E. B. Storey[3]

THE properties of high Mooney viscosity synthetic rubbers plasticized with low-cost oils were reported recently by Swart, Pfau, and Weinstock.[4] These authors found that synthetic rubbers with very high Mooney viscosities, even above 200 ML-4 minutes estimated, could be compounded in the latex state with as much as 100 parts of plasticizer per 100 parts of polymer. Vulcanizates of these highly plasticized polymers, with a correspondingly high amount of HAF carbon black, gave physical properties nearly equal to those of standard GR-S vulcanizates. In the laboratory study relations between the Mooney viscosity of the parent polymer and the amount of oil required for easy processing were found. Several methods of mixing the polymer and the oil were examined; of these the latex compounding technique was preferred. A survey of various types of plasticizers indicated that two petroleum oils, Sundex 53 and Circosol 2XH, gave a satisfactory balance of properties.

The present paper describes the further development of plasticized copolymers of high Mooney viscosity through pilot-plant and commercial production to factory and service trials. Commercial production of a highly plasticized synthetic rubber suitable for use in first-quality tires has been accomplished. Tire tests on the production polymers have shown service ratings significantly better than those of GR-S cold rubber. The overall good quality predicted by the laboratory investigation has been confirmed by tests on the material produced on the commercial scale, and replacement of natural rubber, GR-S, or GR-S cold rubber by this new material can be recommended in the majority of applications.

In the preliminary stages of pilot-plant production quantities of a 71/29 butadiene-styrene copolymer (XPRD-116) were polymerized at 41° F. in an unmodified polymerization system similar in most respects to those used in the production of commercial GR-S cold rubber. The polymer was compounded with oil in the latex state, as described previously.[4] The processing characteristics of the final material were not optimal, but the tire tests, to be reported later in this paper, showed a rating of 118 against a control of GR-S black masterbatch. These encouraging results lent further impetus to the development project.

The data of the laboratory study were supplemented by pilot-plant work in which the modifier, conversion and polymerization temperature were varied. In fact the study has covered a complete range of conversions and includes polymers prepared well beyond the gel point; in all these polymers there was no abrupt change in properties, indicating an upper limit in molecular weight or gel content. However, concurrent with the evaluation of these variables, two restrictions were placed on the scope of the development project to insure rapid attainment of the first objective—a plasticized, high Mooney viscosity polymer suitable for first-line tire treads. In the first place, the polymerization temperature was set at 55° F. Secondly, the maximum conversion was set at 72%. These restrictions reduced the major variables in polymerization to one, i.e., amount of modifier, which controls Mooney viscosity at constant conversion and composition. Experimental polymers with various Mooney levels were compounded with oil and HAF carbon black to give processable compounds, that is, in the region of 60 compound Mooney viscosity.

The physical properties of the vulcanizates were evaluated, and typical trends are shown in Figure 1. The amount of oil required for good processability increased with the Mooney viscosity of the raw polymer. At these optimal oil (and black) levels, the tensile strength, elongation at break, tear strength, and hardness decreased with increasing Mooney viscosity. However, the reduction in any of these properties was not abrupt or great enough in magnitude to establish a maximum limit on the Mooney viscosity of the parent

[1] Presented before the Rubber Chemistry Division, Chemical Institute of Canada, Kitchener, Ont., Canada June 15, 1951.
[2] General Tire & Rubber Co., Akron, O.
[3] Polymer Corp., Ltd., Sarnia, Ont., Canada.
[4] India RUBBER WORLD, June, 1951, p. 309.

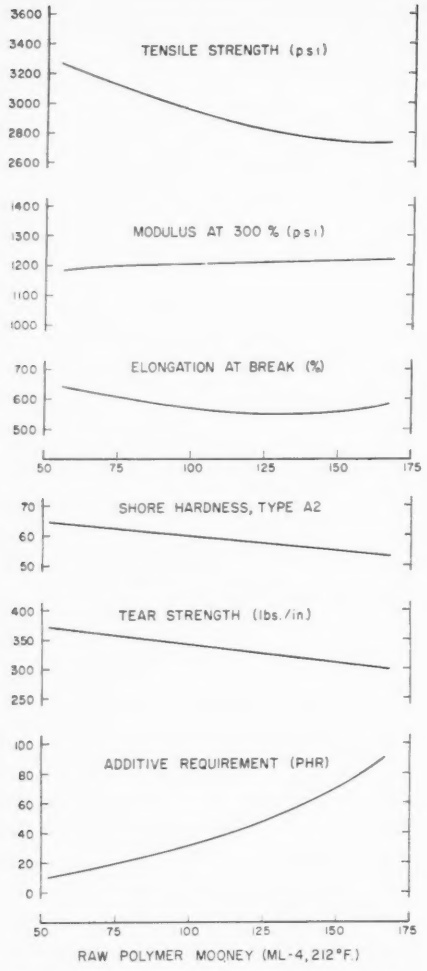


Fig. 1. Effect of Mooney Viscosity of Polymer on the Properties of Tread Vulcanizates

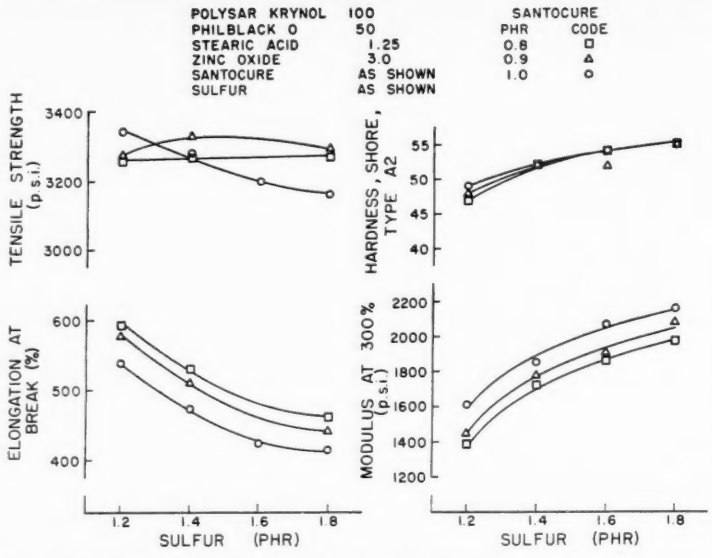


Fig. 2. Effect of Curative Levels on Physical Properties of Vulcanizates of Polysar Krynol

polymer over the range examined. There was, of course, a considerable incentive from the point of view of increased production and cost to raise the oil level to the maximum consistent with good processability and quality of product.

Further, large quantities of polymer were required to establish the optimal level of the Mooney viscosity of the raw polymer. Therefore two polymers, XPRD-129 with a Mooney viscosity above 150 (ML-4 minutes) and XPRD-130 with a Mooney viscosity of 120 (ML-4 minutes), were made in large-scale equipment. The variation in Mooney level was attained by charging different amounts of modifier. These polymers were evaluated in the laboratory and factory with oil added by the Banbury mixing and by the latex compounding techniques. Most of the production was finished as dry, unplasticized polymer since the latex compounding equipment was not yet installed in the commercial unit.

The laboratory and factory tests on these two polymers checked well with the curves shown in Figure 1. The tire test data, which will be presented later in this paper, showed excellent ratings for these polymers. Again, there was no experimental evidence of a practical limit to Mooney viscosity of the polymers in the evaluation data. There was, however, some difficulty in control of the polymerization of XPRD-129 (150 ML-4 minutes) using the available control techniques. It was, therefore, most expedient to reduce the Mooney viscosity of the polymer to a level which could be more easily controlled by normal techniques. The unplasticized polymer produced to this level of approximately 135 ML-4 minutes Mooney viscosity was coded XPRD-211.

Considerable quantities of XPRD-211, unplasticized, were produced in the commercial polymerization unit for large-scale factory evaluation by the Banbury mixing technique. When the latex compounding equipment was installed, oil was added to the high viscosity polymer, using latex compounding techniques described previously.[4] The resulting latex-compounded polymer was coded XPRD-233, and when uniformity of production was insured, the subsequent production was recoded as Polysar Krynol. The curve (additive requirement) of Figure 1 indicated that the oil requirement for XPRD-233 was of the order of 50-55 parts. It was, however, thought desirable to reduce this to 40-45 parts to permit the normal addition of oil during factory Banbury mixing.

The production of Krynol has not yet reached a maximum in the commercial unit, pending installation of more extensive equipment for latex compounding. High rates of production, however, have been reached over short periods of time. These rates were favorable in comparison with those of GR-S and cold rubber production and were accomplished with only minor alterations of processing equipment.

Laboratory Evaluation

The high viscosity polymer XPRD-211 has a higher average molecular weight and a much smaller proportion of low molecular weight polymer than Polysar S (GR-S). The higher average molecular weight of XPRD-211 polymer allows the addition of appreciable quantities of petroleum softener which plasticizes the polymer to a processable level and, as will be shown by laboratory and service tests, confers other desirable properties to the polymer.

A most striking illustration of the qualities of XPRD-

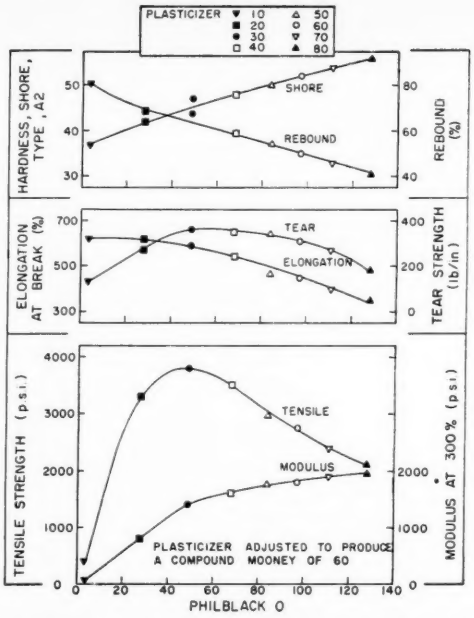


Fig. 3. Variation of the Physical Properties of Vulcanizates of XPRD-211 with HAF Carbon Black and Plasticizer Adjusted to Give a Compound Mooney Viscosity of 60 ML-4 Minutes

211 may be shown by comparing the properties of this polymer with those of Polysar S, Polysar Krylene (71/29 butadiene/styrene polymerized at 41° F.), and natural rubber in a common recipe containing 50 parts of Circosol 2XH and 75 parts of Philblack O per 100 parts of polymer, Table 1. The higher molecular weight of XPRD-211 permitted a compound Mooney viscosity in the processable range of 60 ML-4 minutes, while the compound Mooney viscosities of the lower molecular weight polymers were below 30 ML-4 minutes. It should be noted, in particular, that the tensile strength of the XPRD-211 vulcanizate was about 1000 p.s.i. higher than that of the other vulcanizates, and that a satisfactory level of modulus at 300% and Shore hardness was maintained with no sacrifice in elongation at break or tear strength.

TABLE 1. EFFECT OF 50 PHR CIRCOSOL 2XH ON THE VULCANIZATE PROPERTIES OF VARIOUS POLYMERS

	XPRD-211	Smoked Sheets	Polysar Krylene*	Polysar S†
Polymer	100	100	100	100
HAF black	75	75	75	75
Circosol 2XH	50	50	50	50
Stearic acid	2	3	1	1
AgeRite White	....	1	....	....
Zinc oxide	5	5	5	5
Santocure	1.25	0.5	1.25	1.25
Sulfur	2	2.5	2	2
Compound mooney (ML-4', 212° F.)	59	21	29	25
Press cure at 292° F. (min.)	45	25	60	45
Hardness, Shore, Type A2	49	46	41	43
Modulus at 300% (p.s.i.)	1640	1040	1000	1160
Tensile strength (p.s.i.)	3050	2040	2270	2060
Elongation at break (%)	480	480	575	480
Tear strength (lbs./in.)	295	350	265	235

* GR-S cold rubber.
† Standard GR-S.

An investigation was carried out to estimate the proper accelerator and sulfur levels for the polymer-oil blend. As a first estimate, it was assumed that the oil had no effect on the vulcanization of the polymer and that the curative levels should be based upon the polymer content at the normal level for a low-temperature GR-S polymer. The test data are shown in Figure 2. A satisfactory balance of physical properties was considered to result from the use of 0.9-part of Santocure and 1.4 parts of sulfur. Hence, the original assumption was essentially correct. The basic compounding scheme for the polymer-oil blend containing, say 50 parts of oil per 100 parts of polymer, may be illustrated as in Table 2. Here the compounding ingredients normally employed in a tread-type recipe, with the exception of the carbon black, are based on the polymer content. When the recipe is shown in the usual form, by reducing the polymer-oil blend quantity to 100, it will be seen that there is little difference from the usual tread-type recipe. The accelerator and sulfur contents, however, are lower per unit volume of tread compound, and this decrease represents a saving in these essential materials.

TABLE 2. COMPARISON OF TREAD STOCK RECIPE ON THE BASIS OF 100 POLYMER AND 100 POLYMER-OIL

Regular Recipe		Polymer-Oil Latex Blend Recipe	
XPRD-211	100	Krynol	100 or 100
Oil	50	Softener	5 or 5
Philblack O	75	Philblack O	51.7 or 50
Zinc oxide	5	Zinc oxide	3.5 or 3
Stearic acid	2	Stearic acid	1.4 or 1.4
Santocure	1.25	Santocure	0.86 or 0.9
Sulfur	2	Sulfur	1.38 or 1.4

The effect of a variation in the Sundex 53 and HAF carbon black levels on the physical properties of an XPRD-211 vulcanizate were determined in the basic recipe described above. The Sundex 53 levels required to produce a 60-Mooney viscosity, mill-mixed compound for HAF carbon black levels ranging from five to 130 PHR are shown in Figure 3. Although the maximal tensile strength for this polymer-oil system occurred around 50 PHR of HAF carbon black and 30 PHR of oil, the optimal balance of processability and physical properties based on factory and road test data was found at a higher loading of carbon black and Sundex 53. Indeed, the potentialities of this high-Mooney viscosity polymer are well illustrated by the tensile strength of 2000 p.s.i. obtained at a loading of 130 PHR of Philblack O and 80 PHR of Sundex 53. At these high loadings the other physical properties were of the same order as those of tread compounds obtained with other types of commercial polymers.

Therefore a suitable ratio for an HAF carbon black tread compound would be:

XPRD-211	100
Sundex 53	50
HAF carbon black	75

The first plant production of the latex compound XPRD-233 was tested in the laboratory, and it was found that the presence of the oil protected the high-Mooney polymer to some extent from breakdown during compounding. The Mooney of the XPRD-233 compound was some four points higher, and the vulcanizate had a slightly higher tensile strength than the mill-mixed XPRD-211 vulcanizate. The other test properties were comparable with those shown for XPRD-211, Table 3. The XPRD-233, or Polysar Krynol, may be found to be somewhat less plastic than, say, GR-S, in a 50 PHR Philblack O compound, and this may be adjusted by the normal addition of softener during factory compounding operations.

The effect of high temperatures on a polymer during processing may be estimated by measuring the rate of gel formation when 100 grams of the raw polymer are milled on a six-inch by 12-inch mill at a roll temperature of 300° F. This test, Table 4, showed that the XPRD-233 polymer-oil blend was at least as stable during treatment as Polysar S and Polysar S-50.

TABLE 3. COMPARISON OF VULCANIZATE PROPERTIES OF XPRD-211 AND XPRD-233 TREAD COMPOUNDS

	XPRD-233 (Polymer-Oil Latex Cmpd.)	XPRD-211† (Polymer-Oil Mill Blend)
Compound Mooney (ML-4′, 212° F.)		
(a) 40 PHR Philblack O*	55.5	46.0
(b) 50 PHR Philblack O	65.0	60.0
(c) 60 PHR Philblack O	75.5	72.0
(d) 70 PHR Philblack O	91.5	87.0
Cure at 292° F. (min.)		
(a) 40 PHR Philblack O	70	65
(b) 50 PHR Philblack O	60	35
(c) 60 PHR Philblack O	55	40
(d) 70 PHR Philblack O	40	30
Hardness, shore, Type A2		
(a) 40 PHR Philblack O	44	41
(b) 50 PHR Philblack O	48	48
(c) 60 PHR Philblack O	53	56
(d) 70 PHR Philblack O	63	64
Modulus at 300% (p.s.i.)		
(a) 40 PHR Philblack O	1290	950
(b) 50 PHR Philblack O	1750	1650
(c) 60 PHR Philblack O	2330	2350
(d) 70 PHR Philblack O	2780	3060
Tensile strength (p.s.i)		
(a) 40 PHR Philblack O	3460	3710
(b) 50 PHR Philblack O	3350	3390
(c) 60 PHR Philblack O	3200	3070
(d) 70 PHR Philblack O	3060	2760
Elongation at break (%)		
(a) 40 PHR Philblack O	570	655
(b) 50 PHR Philblack O	500	525
(c) 60 PHR Philblack O	400	390
(d) 70 PHR Philblack O	330	260
Tear strength (lbs. /in.)		
(a) 40 PHR Philblack O	360	380
(b) 50 PHR Philblack O	360	355
(c) 60 PHR Philblack O	340	330
(d) 70 PHR Philblack O	310	305
Rebound (%)		
(a) 40 PHR Philblack O	60.4	62.5
(b) 50 PHR Philblack O	55.3	58.0
(c) 60 PHR Philblack O	51.9	53.5
(d) 70 PHR Philblack O	46.3	49.0

*Based In 100 parts of XPRD-233.
†Equivalent recipe to that for XPRD-233. Values obtained by interpolation.

TABLE 4. POLYMER STABILITY AT 300° F.

(6- by 12-Inch Mill, 100-Gram Sample)

Time at 300° F. (Min.)	XPRD-233 Gel %	Polysar S Gel %	Polysar S-50 Gel %
0	5.7	2.8	0.7
3	2.0	3.0	2.3
6	1.2	7.9	0.9
9	1.3	4.3	0.9
12	1.8	0.8	0.9

TABLE 5. AGE RESISTANCE OF VULCANIZED XPRD-233 AND POLYSAR S
ASTM Method D865-48T—Air at 100° C.

Time of Aging (days)	Tensile (P.S.I.) Mean	Tensile (P.S.I.) S*	Elongation (%) Mean	Elongation (%) S*	Mod. at 100% (P.S.I.) Mean	Mod. at 100% (P.S.I.) S*
			XPRD-233			
0	3695	75	556	17	236	21
1	3318	99	415	23	384	35
4	2964	289	309	29	564	48
7	2813	119	270	10	657	52
			Polysar S			
0	3916	262	321	14	538	29
1	3432	444	239	26	810	49
4	3153	274	181	16	1190	134
5	2685	296	152	14	1335	66

* S—standard deviation.
NOTE: 12 specimens were tested at each point.

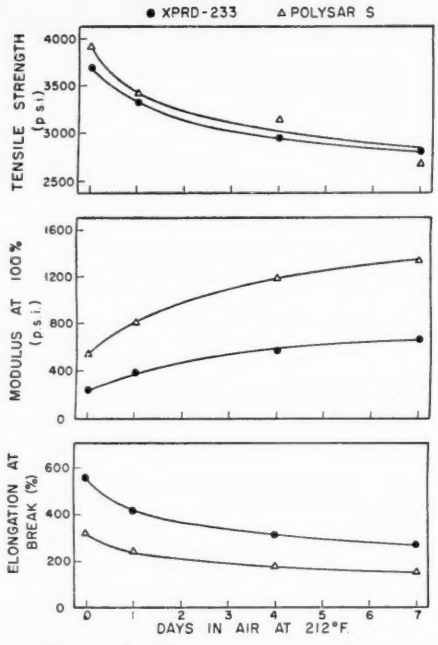


Fig. 4. Effect of Heating in Air at 212° F. on Tensile Strength, Modulus, and Elongation at Break of XPRD-233 and Polysar S

A check was made of the volatile loss of XPRD-233 by a modification of the Rubber Reserve specification method for determining moisture in production polymer which involves milling the polymer for four minutes on a six-inch by 12-inch mill at a roll temperature of 215° F. The total loss in weight of XPRD-233 after the milling treatment for 45 minutes at 215° F. was only 0.5%; hence, no large loss of material should be expected to occur during normal factory processing operations.

The effect of heating the tread vulcanizate in air at 212° F. was determined by the ASTM test tube method,[5] and a comparison was made with the change in properties shown by a vulcanizate of Polysar S in an equivalent tread recipe. The experimental data are given in Table 5 and plotted in Figure 4. These data show that these highly plasticized polymers are equal in age resistance to Polysar S types.

[5]ASTM Method D865-48T, Test-Tube Aging, p. 1146. "A.S.T.M. Standards on Rubber Products," American Society for Testing Materials, 1916 Race St., Philadelphia 3, Pa. (1950).

TABLE 6. POLYSAR S AND XPRD-233 TREAD VULCANIZATES

TENSILE PROPERTIES: 77° F. vs. 212° F.

	Polysar S	XPRD-233
Polymer	100	100
Carbon black	50	50
Paraflux	5	...
Stearic acid	1	1.4
Zinc oxide	5	3.5
Santocure	1.25	0.9
Sulfur	2	1.4
Cure at 292° F. (min.)	70	70

Polymer / Carbon Black	Polysar S Wyex (EPC)		XPRD-233 Philblack O (HAF)		XPRD-233 Wyex		XPRD-233 Continental A (MPC)	
Test Temperature (° F.)	77	212	77	212	77	212	77	212
Stress (p.s.i.) at % Elongation								
100	370	280	315	270	185	135	200	180
200	965	730	965	775	395	305	395	325
300	1780	....	1845	....	820	525	770	555
400	2690	....	2630	....	1270	865	1305	930
500	....	....	....	....	1795	....	1850	....
600	....	....	....	....	2400	....	2510	....
700	....	....	....	....	3320	....	....	....
Tensile strength (p.s.i)	3140	1125	2970	1240	3570	1145	3380	1145
Elongation at break (%)	450	265	460	390	720	480	660	430

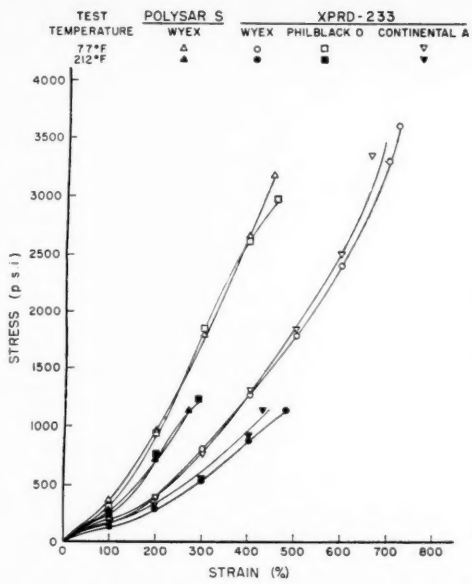


Fig. 5. Stress-Strain Curves of XPRD-233 and Polysar S at 77 and 212° F. with Three Types of Carbon Black

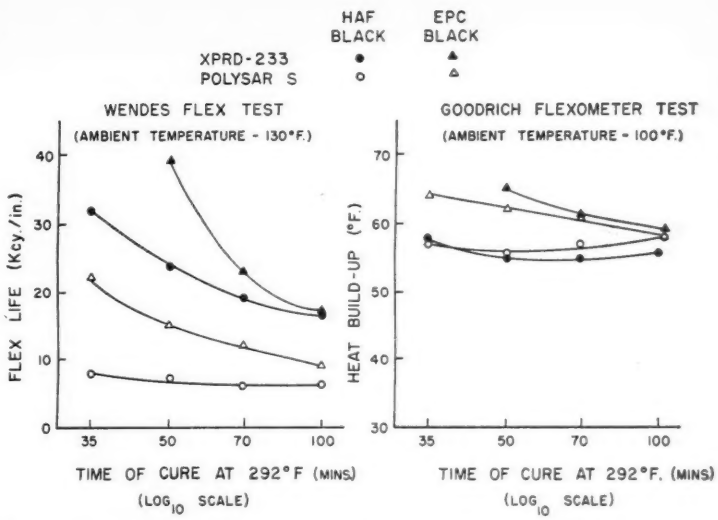


Fig. 6. Flex-Hysteresis Properties of XPRD-233 and Polysar S Tread Vulcanizates

The stress-strain curves of an XPRD-233 and Polysar S tread vulcanizates at both 77 and 212° F. are shown in Table 6 and Figure 5. The XPRD-233 vulcanizates showed a lower stress than that for Polysar S at low elongations and in this respect was more similar to a natural rubber vulcanizate. The stress-strain and tensile strength curves of the XPRD-233 vulcanizates with HAF carbon black were comparable with those of the Polysar S vulcanizate with EPC carbon black at both test temperatures.

The flex life and heat build-up are important properties of a tread vulcanizate. These properties were evaluated for Philblack O tread vulcanizates by the Wendes flex test and the Goodrich flexometer test. The test data for XPRD-233 and Polysar S vulcanizates are shown in Figure 6. The flex life of the XPRD-233 vulcanizate was at least twice that of the Polysar S vulcanizate, and the heat build-up was slightly lower than that shown by Polysar S.

The effect of softener loading on an XPRD-233 tread compound with HAF carbon black and a comparison of the properties of HAF and EPC carbon blacks are given in Table 7 and Figure 7. The addition of softener to the HAF tread recipe lowered the compound Mooney and increased the cure time and rate of extrusion. A replacement of HAF carbon black by an EPC black had little effect on the compound Mooney, but increased the cure time and lowered the rate of extrusion. The effect of such changes in recipe on the modulus was quite marked. An addition of softener to the HAF carbon black recipes, or a replacement of this type of carbon black by an EPC black, produced a considerable decrease in modulus. Either of these changes in recipe lowered the Shore hardness, but only the addition of softener resulted in a decrease in tensile strength.

An investigation was made of the properties of an XPRD-233 tread compound as compared with Polysar S, Polysar Krylene, and natural rubber compounds in a 50 PHR Philblack O recipe. These compounds were

TABLE 7. EFFECT OF VARIATION OF CARBON BLACK AND SOFTENER LOADING ON THE PROPERTIES OF XPRD-233 COMPOUNDS

Base Recipe: XPRD-233 100
Carbon black ..... as shown
Circosol 2XH ..... as shown
Zinc oxide 3
Stearic acid 1.25
Santocure 0.9
Sulfur 1.4

Philblack O (PHR)	Wyex (PHR)	Circosol 2XH (PHR)	Compound Mooney (ML-4', 212° F.)	Mooney Cure Point (Min. @ 292° F.)	Extrusion Rate (Cc. 15 Sec.)	Die Swell (%)	Press Cure (Min. @ 292° F.)	Hardness Shore, Type A2 (30-Sec.)	Mod. at 300% (P.S.I.)	Ten. Strength (P.S.I.)	Elong. at Break (%)	Tear Strength (Lbs./In.)	Rebound % (70 Min. @ 292° F.)
40	..	..	55.5	14.9	12.3	177	70	44	1290	3460	570	360	60.4
50	..	..	65.0	15.0	16.5	160	60	48	1750	3350	500	360	55.3
60	..	..	75.5	13.2	15.8	148	55	53	2330	3200	460	340	51.9
70	..	..	91.5	11.3	14.5	134	40	63	2780	3060	330	310	46.3
40	..	5	47.0	16.8	17.5	155	70	39	950	2840	600	315	63.0
50	..	5	54.5	15.7	16.8	156	65	45	1450	2820	500	345	57.7
60	..	5	64.5	14.8	16.9	144	60	51	1940	2760	380	330	51.0
70	..	5	66.0	13.3	17.0	126	55	57	2460	2750	325	320	47.7
40	..	10	41.5	16.8	16.8	156	55	37	800	2380	605	290	61.5
50	..	10	47.0	16.9	16.5	150	65	41	1130	2380	505	310	56.3
60	..	10	56.5	15.3	16.5	145	75	51	1700	2960	470	345	49.0
70	..	10	67.5	14.6	16.4	133	65	54	2080	2650	395	305	46.3
20	20	5	49.0	19.8	16.2	163	50	40	680	3420	800	305	57.8
25	25	5	55.5	18.3	15.4	166	65	44	1170	3320	660	345	52.3
30	30	5	65.5	16.7	15.1	153	60	49	1560	3200	550	345	48.1
35	35	5	78.5	15.0	14.6	139	70	53	1950	3030	450	310	42.8
..	40	5	48.0	22.3	14.3	162	70	37	525	3225	800	275	56.3
..	50	5	54.0	21.4	15.0	166	75	43	740	3450	770	320	50.6
..	60	5	64.0	19.8	14.5	164	70	49	980	3270	700	335	45.5
..	70	5	72.0	18.3	15.2	146	70	54	1225	2800	570	335	41.9

prepared in a Type B Banbury at a starting temperature of 220° F., at 77 r.p.m., using the recipe and mixing schedule in Table 8.

TABLE 8. LABORATORY TREAD COMPOUNDS

Banbury: Type B
Speed (r.p.m.): 77
Starting temperature (°F.): 220

Recipe	
Polymer	100
Philblack O	50
Paraflux	5
Zinc oxide	3
Stearic acid	2

Polymer	Santocure	Sulfur
XPRD-233	0.90	1.40
Polysar S	1.20	1.75
Polysar Krylene	0.95	1.75
Smoked Sheets	0.40	2.50

Mixing Schedule	Min.
Polymer	0—1
½ Philblack O	1—3
½ Philblack O Plus zinc oxide and stearic acid	3—5
Paraflux	5—6½
Masterbatch (above)	0—½
Santocure and sulfur	½—3

Polymer	XPRD-233	Polysar S*	Polysar Krylene†	Smoked Sheets
Maximum mix temperature (°F.)				
(a) Masterbatch	337	331	334	343
(b) Productive mix	278	282	273	254
Mooney (ML-4', 212° F.)				
(a) Masterbatch	86.0	73.0	82.5	69.5
(b) Compound	63.5	59.5	69.5	59.0
(c) Extruder sample	46.5	49.0	64.0	39.0
Mooney scorch test (ML, 293° F.)				
(a) Minimum Mooney	35.0	29.0	40.0	32.5
(b) Scorch point (min.)	12.5	14.5	14.5	3.5
(c) Cure point (min.)	17.8	20.7	22.8	8.4
Extrusion Test (½ Royle, 220° F., ⅛-inch diameter die)				
(a) Rate (cc. 15-sec.)	16.6	16.7	20.0	20.7
(b) Die swell (%)	160	192	174	129
Press cure at 292° F. (min.)	60	50	60	35
Hardness, Shore, Type A2 (30 sec.)	49	56	56	56
Modulus at 300% (p.s.i.)	1375	2020	2100	1950
Tensile strength (p.s.i.)	3150	3260	3780	3790
Elongation at break (%)	580	430	520	510
Tear strength (lbs. in.)	315	360	450	445
Rebound (%)‡	56.8	60.4	59.8	69.6

*Standard GR-S.
†GR-S cold rubber.
‡Cure—70 min. at 292° F.

The masterbatch Mooney of the XPRD-233 compound was similar to that of the Polysar Krylene compound, but underwent a larger decrease during the subsequent milling, and the extruded compound showed a Mooney value similar to that of the Polysar S and smoked sheet compound. The extrusion rate was similar to that of the Polysar S compound, but the die swell was intermediate between that of the Polysar Krylene and the smoked sheet compound. The extruded XPRD-233 compound, then, showed a good retention of the die dimensions. The tensile strength and tear strength of the XPRD-233 vulcanizate was similar to that of Polysar S. The hardness and modulus at 300% and rebound value were lower than for the other vulcanizates. The elongation at break, however, was relatively high and may be related to the superior flex life and heat build-up properties shown under dynamic test conditions.

A series of different types of carbon black was

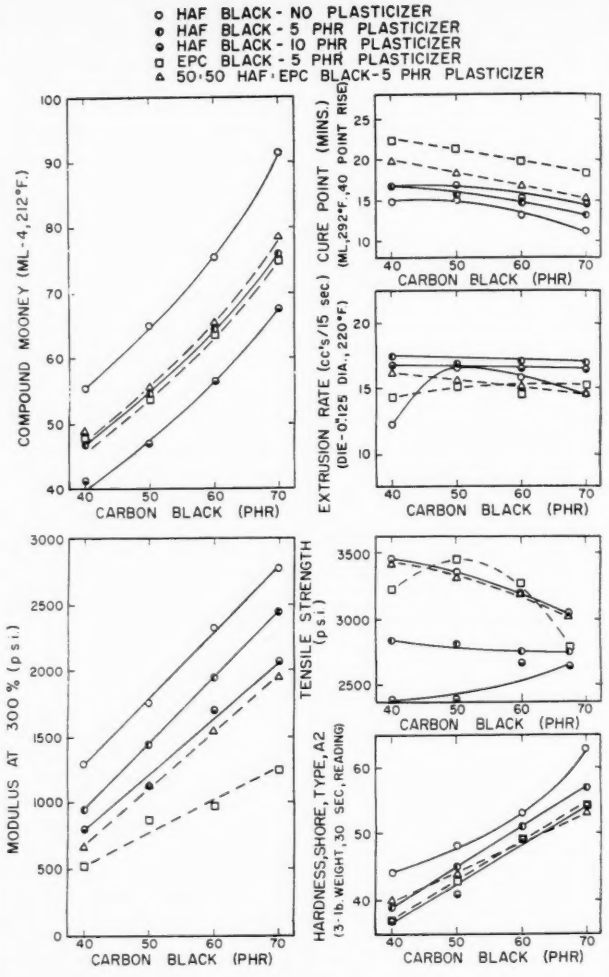


Fig. 7. Effect of Variation of HAF and EPC Carbon Black Content with Various Levels of Oil Plasticizer on Compound Properties of XPRD-233

evaluated in a Krynol tread-type recipe, and it was found that channel blacks, with the exception of the European CK4, gave a lower modulus than that provided by the HAF or FF types of carbon black, Table 9.

The use of Krynol in blends with cold rubber (X-598) was investigated by blending factory mixed stocks of the two rubbers on a laboratory mill. The test data are presented in Table 10. Tensile strengths of these blends were equivalent. Krynol contributed higher elongation at break, lower modulus and hardness in this system.

TABLE 9. PROPERTIES OF POLYSAR KRYNOL WITH 50 PHR OF VARIOUS CARBON BLACKS

Polysar Krynol	100
Carbon black	50
Stearic acid	1.25
Zinc oxide	3
Santocure	0.9
Sulfur	1.4

	Compound Mooney (ML-4', 212° F.)	Cure at 292° F. (Min.)	Shore Hardness (Type A2)	Mod. @ 300% (P.S.I.)	Tensile Strength (P.S.I.)	Elongation at Break (%)	Tear Strength (Lbs. /In.)	Rebound* (%)
CK4 Black (EPC)	55.0	65	52	1360	3680	640	350	51.5
Continental A (MPC)	64.0	80	50	710	3710	770	320	47.2
Philblack O (HAF)	62.0	55	49	1500	3260	555	325	56.3
Statex K (VFF)	60.0	50	46	1040	3405	710	345	51.5
Sterling 105 (FF)	53.0	55	44	790	3195	790	325	51.0
Wyex (EPC)	61.5	80	48	800	3690	770	315	50.2
Vulcan 3 (HAF)	58.0	50	52	1840	3160	495	310	55.9

*Cure: 70 min. at 292° F.

TABLE 10. PHYSICAL PROPERTIES OF BLENDS OF KRYNOL AND GR-S COLD RUBBER

Krynol	100	75	50	25	0
GR-S Cold Rubber	0	25	50	75	100
Mod. @ 300%, p.s.i.					
15 min. @ 287° F.	200	300	425	500	750
30	900	1050	1100	1300	1325
45	1200	1325	1400	1500	1675
60	1300	1400	1525	1700	1650
90	1500	1550	1625	1700	1750
Tensile (p.s.i.)					
15	925	1350	1600	2000	2550
30	2650	2800	2800	2850	2550
45	3050	3125	3000	3125	2975
60	2900	3125	3250	3000	2900
90	2925	3175	3250	2700	3025
Elongation (%)					
15	770	775	755	735	730
30	620	600	590	575	505
45	550	560	535	525	490
60	505	540	550	480	470
90	370	500	500	445	480
Durometer					
15	45	50	55	58	60
30	54	56	60	64	66
45	55	59	63	65	68
60	57	60	64	65	68
90	59	61	64	65	68
Rebound %	56.9	56.4	57.4	57.9	59.5

Experimental Procedures

Raw Polymer Heat-Stability

A 100-gram sample of raw polymer is banded on a six- by 12-inch mill with the roll setting adjusted to give a rolling ¼-inch diameter bank and with the rolls heated to 300° F. A one-gram sample is scrapped off the roll after milling times of three, six, nine, and 12 minutes. The gel content of the treated polymer is determined by the Harris cage method with toluene as solvent.

Compounding

(a) The laboratory mill-mixed compounds were prepared on a six- by 12-inch mill by the procedure outlined for GR-S in the "Specifications for Government Synthetic Rubbers," Reconstruction Finance Corp., Office of Rubber Reserve, Washington, D. C. When relatively large quantities of carbon black and oil were required to be added to the polymer, small quantities of the black and oil were added alternately.

(b) The laboratory Banbury-mixed compounds were prepared in a "Type B" Banbury at 77 r.p.m., using a final batch size of approximately 1000 cubic centimeters. The compounding schedule is shown in Table 8.

Compound Mooney Viscosity

The compound Mooney viscosity was determined at a temperature of 212° F., using the large rotor and following the ASTM test procedure, D927-49T.

Mooney Scorch Test

The Mooney scorch test was run with the large rotor at a machine temperature of 292° F. The Mooney machine was loaded, and the test started without any warm-up period. A reading of the Mooney viscosity was taken every 30 seconds, until the value became 140.

The scorch point was taken as the time after which the Mooney viscosity showed a consistent rise of at least one point a minute. The cure point was taken as the time to reach a Mooney viscosity of 40 points above the minimum test value.

Extrusion Test

The compounded polymer was extruded through a ⅛-inch circular die opening using a #½ Royle extruder at 68 r.p.m. and 220° F.

After an initial run of one minute, five consecutive 15-second lengths were taken and weighed. The median value was converted to a volume basis, by using the calculated specific gravity of the compound, and expressed as the rate of extrusion in cubic centimeters per 15 seconds.

Two ten-inch lengths were cut from each 15-second run, and the median value of the average weight for each 15-second run was obtained. The die swell was calculated as the percentage increase in cross-sectional area of the extruded section over that of the die opening.

Vulcanization

Each compound was vulcanized at 292° F. for a range of cure times, which included an over- and under-cure, by the procedure outlined in the "Specifications for Government Synthetic Rubbers."

Shore Hardness

The Shore hardness was measured with a Type A2 durometer, using a stand which applied this instrument, under a total dead-weight of three pounds, to the end-section of three-piled dumbbells. The test area was held fixed under a spring clamp, and the reading was taken 30 seconds after application of the durometer point on to the vulcanizate.

Tensile Test

The tensile properties of the vulcanizate were measured for three ASTM-die "C" dumbbell specimens (D412-49T) at an ambient temperature of 77° F., using an L-6 Scott tester running at a speed of 20 inches a minute. The median of the three values was selected as the test result for the vulcanizate.

The tensile values were recorded for the estimated optimal cure as follows. The test values were plotted against the logarithm of the time of cure, and a smooth curve was drawn through the observed points. In the Santocure recipe it was observed that there was a decrease in the rate of change of modulus with time at about the optimal tensile cure. The other test properties either showed a maximum at this cure, or their rate of change in value was much reduced beyond this cure time. This point was selected, then, as the optimal cure time.

Tear Strength

Two ASTM die "C" tear specimens (D624-48) were cut from the sheet of vulcanizate, used above, and the tear strength was measured at an ambient temperature of 77° F., using the Scott tester. The maximum test load was expressed as pounds per inch of specimen thickness, and the average value for the two specimens was taken as the tear strength of the vulcanizate.

Rebound

The compound was vulcanized at 292° F. for a time approximating the optimum tensile cure, and the per cent. rebound was determined with the Goodyear-Healey apparatus at an ambient temperature of 77° F. (ASTM test method D1054-49T).

Flex Life

The flex-crack growth resistance was measured, using a de Mattia test specimen (ASTM test method D813-44T), which was punched with a 0.02-inch slit in the center of the groove. The specimen was tested on a Wendes flexing machine (2⅝-inch stroke, 400 cycles a minute) at an ambient temperature of 130° F. The specimen was given an initial number of flexes to develop a crack approximately 0.2-inch in length, after which the rate of crack growth was measured during three consecutive flexing periods, adjusted to produce a crack growth of about 0.14-inch per period. The median value of these three periods was corrected for the thickness of the specimen by multiplying the observed value by the ratio of the actual thickness to the specified thickness (0.156-inch) of the vulcanizate under the groove. Four specimens were tested at each cure time, and the average calculated value was expressed as the flex life in kilocycles per inch of crack growth.

Heat Build-Up

The heat build-up was measured on a Goodrich flexometer under a load of 143 pounds per square inch and an impressed compression of 0.175-inch applied at a rate of 1800 cycles a minute. The test was run for 15 minutes, at an ambient temperature of 100° F., and the final temperature was measured with a thermocouple situated at the base of the test pellet. The specimen was obtained by cutting two 0.7-inch diameter disks from each end of the flex strip and forming a composite sample approximately one inch in height.

Four composite samples were tested at each cure time, and the average difference between the final and the ambient temperature was taken as the heat build-up in degrees Fahrenheit.

Test-Tube Aging

ASTM designation was used with the following modifications: micro dumbbell specimens, 2⅝-inch long with a distance of 0.5-inch between gage marks, were cut from vulcanized sheets 0.30-inch in thickness. These micro specimens are believed to be a better thickness for aging tests than the standard dumbbell specimens. Twelve of the micro specimens, all cut from the same vulcanized sheet, were tested in the unaged state and a similar number after each of the aging periods of one, four, and seven days at 212° F.

(To be continued)

Pressure-Sensitive Labeling Tape

LABELON tape, the new pressure-sensitive labeling tape which can be permanently marked, is now available in four colors and four widths from Labelon Tape Co., Rochester, N. Y. Originally introduced in two colors and two widths, the tape is now being made in black, blue, green, and red in ⅝-, ¾-, 1-, and 1½-inch widths in 400-inch long standard and 800-inch long industrial rolls. Standard rolls up to one inch wide are packaged in a self-dispenser with built-in cutting edge; while industrial rolls are mounted on a three-inch core and fit any of the heavy-duty tape dispensers.

Labelon tape is made of two layers of acetate with a white, waxy substance laminated in between and has a neoprene-base pressure-sensitive adhesive undercoating that permits the tape to be transferred from one surface to another without leaving a sticky residue. Pressure on the top clear layer of acetate destroys the waxy interlayer and exposes the bottom colored layer of acetate to view, somewhat on the order of children's Magic Slates. The impression can be made by any type of stylus or by a typewriter and gives markings that are permanent, waterproof, smudge-proof, and resistant to many chemicals.

Since the tape is made from non-hygroscopic acetate, it will not turn yellow with age, discolor, or curl up at the edges, it is claimed. It will adhere and remain legible over a temperature range of from —40 to 150° F., and the four colors and widths allow for numerous coding combinations.



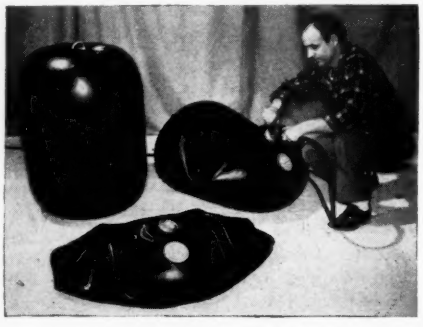
For Permanent Smudge-Proof Identification

Rubber-Fabric Shipping Drum

A NEW 55-gallon synthetic rubber-fabric collapsible drum suitable for shipping liquids, has been developed by United States Rubber Co., Rockefeller Center, New York 20, N. Y. The returnable, reusable drum is already being produced in limited quantities for essential uses in the petroleum and liquid chemical fields. Sizable savings in return shipping costs are expected since more than 2,500 collapsed drums can be shipped in a standard railroad box car that would hold only 300 rigid drums.

Tests made by the company indicate that the new drum is suitable for shipping oils, greases, fats, acids, paints, emulsions, soaps, dry powders, and a variety of pharmaceutical and industrial chemicals. The drum is also believed to be practical for transporting liquids by air for the military and for dropping liquids by parachute to ground troops.

The product is made of Ustex cord fabric impregnated with synthetic rubber and molded in one piece. The result is a tough, flexible drum approximateing the size of a regular barrel or drum. It is equipped with simple fittings for filling, emptying, lifting, and handling. Other advantages of the new product are that it needs no venting, while being filled or emptied, and is easier to fill, empty, and clean than metal drums because of its flexibility and elimination of corner pockets.



U. S. Rubber's Rubber-Fabric Shipping Drums, Showing *(Left)* Full Drum, *(Right)* Drum Being Filled, and *(Foreground)* Collapsed Drum

Evaluation of Various Torsion Wires for the Gehman Apparatus Used for Determining Low-Temperature Stiffness of Elastomers[1]

B. G. Labbe[2]

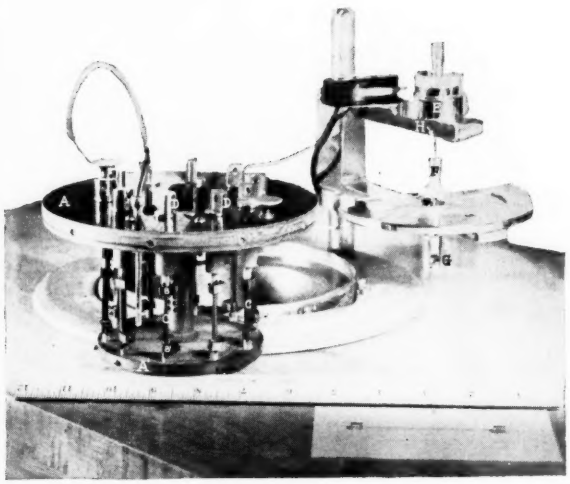


Fig. 1. Cylindrical Sample Rack and Torsion Head of Gehman Apparatus for the Measurement of Low-Temperature Stiffening of Elastomers: *A* and *A'*, Top and Bottom Micarta Disks of Sample Rack; *B* and *B'*, Sample Grips; *C*, Samples; *D*, Studs for Connection to Torsion Head Screw Connector; *E*, Torsion Head; *F*, Sleeve around Torsion Wire; *G*, Screw Connector; *H*, Torsion Wire

ONE of the principal components of the Gehman torsional apparatus (Figure 1) for the determination of the low-temperature properties of rubber and rubber-like materials is the torsion wire. The method of test (D 1053-49T) outlined in the American Society for Testing Materials' handbook, "ASTM Standards for Rubber Products, April 1, 1950," is vague in that it specifies the thickness and the length of the wire, rather than the torsional constant. Consequently, at the request of the chairman of the subcommittee on low-temperature testing of ASTM Committee D-11, the Government Laboratories conducted tests comparing the five available grades of torsional wires which are coded as follows:

Calibration Number	Color Code	Torsional Constant Gram-Centimeters per Degree of Twist
I	Black	0.125
II	Green	0.250
III	Yellow	0.500
IV	Red	1.600
V	White	2.000

When the Gehman apparatus was first placed on the market, the green code wires were reported to possess the same torsional constant as the wires originally used by S. D. Gehman. Later the yellow code wires were supplied as standard. The work reported in this paper results from a program established to determine the differences which might arise because of the use of different wires in various laboratories.

To test a number of stocks of different stiffness values at room temperature, vulcanizates of compounds prepared from the following raw materials were selected:

1. Standard GR-S (40 p.h.r. of EPC carbon black)
2. Standard GR-S (60 p.h.r. of EPC carbon black)
3. Standard GR-S (80 p.h.r. of EPC carbon black)
4. Standard GR-S (100 p.h.r. of EPC carbon black)
5. 70/15/15 butadiene/cyanobutadiene/styrene
6. Perbunan 18
7. Polybutadiene (made at 122° F.)
8. Geon 202 (furnished by B. F. Goodrich Chemical Co.)
9. Natural rubber in a tread recipe
10. Natural rubber in a gum recipe

For the purpose of this work the actual composition of the compounds is unimportant.

With each grade of wire, all ten test specimens were tested at one time in the Government Laboratories' 10-station apparatus in which liquid nitrogen is employed as coolant.

[1] The work reported herein was carried out under the sponsorship of the Office of Rubber Reserve, Reconstruction Finance Corp., in connection with the government synthetic rubber program.

[2] University of Akron, Government Laboratories, Akron, O.

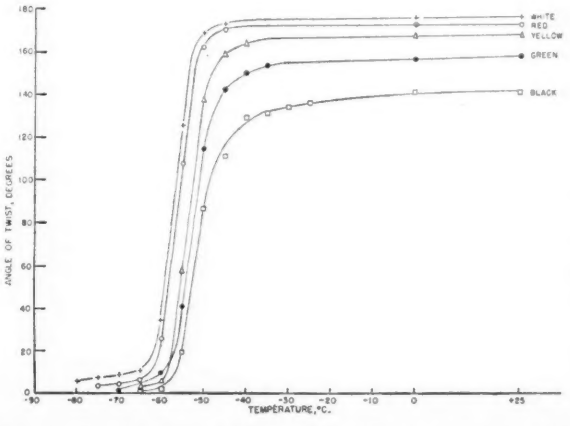


Fig. 2. Typical Curves Obtained on Gehman Apparatus with Each of Five Wires; Natural Rubber Tread Compound Used

TABLE 1. GEHMAN LOW-TEMPERATURE TEST DATA

	Wire Color Code	GR-S 40 P.H.R. CB	GR-S 60 P.H.R. CB	GR-S 80 P.H.R. CB	GR-S 100 P.H.R. CB	70/15/15 BD/CyanoBD/S	Perbunan 18	PolyBD	Geon 202	Natural Rubber (Tread Recipe)	Natural Rubber (Gum Recipe)
Shore A Hardness		61	73	83	90	83	66	59	81	55	36
					Angular Degrees of Twist at 25° C.						
	White	176	171	167	159	169	173	174	174	176	178
	Red	173	164	158	147	162	168	171	...	173	176
	Yellow	166	151	139	116	144	159	164	161	168	173
	Green	151	126	105	82	118	140	150	146	158	168
	Black	129	93	67	40	81	114	127	124	141	159
					Temperatures, Minus °C.						
T_2	W	25	19	15	12	+7	18	49	+9	47	20
	R	14	16	11	6	+9	17	45	...	48	44
	Y	18	16	13	10	+9	17	40	+10	46	31
	G	21	15	12	8	+9	18	41	+11	46	23
	B	17	11	9	2	+13	18	39	+12	45	17
T_5	W	37	36	34	33	1	27	64	2	52	49
	R	36	36	33	28	1	25	62	...	53	50
	Y	37	34	30	28	0	25	59	0	50	49
	G	37	34	31	24	+2	25	61	+1	51	44
	B	36	32	27	25	+4	25	58	+2	51	44
T_{10}	W	41	41	40	39	3	28	68	8	54	53
	R	41	40	39	37	4	27	67	...	54	54
	Y	41	39	35	35	3	27	64	6	52	53
	G	41	39	38	35	1	26	65	4	53	49
	B	41	39	35	38	1	27	64	4	53	48
T_{100}	W	48	49	48	47	13	35	74	25	59	58
	R	49	47	47	48	11	35	74	...	60	59
	Y	47	47	45	50	13	33	71	19	57	59
	G	49	49	49	52	14	34	72	24	59	58
	B	45	49	48	50	15	34	71	23	58	56
F. P.	W	52	51	49	49	15	38	77	29	62	62
	R	52	49	50	49	11	35	76	...	62	62
	Y	48	48	44	45	9	32	72	21	59	61
	G	49	48	48	47	8	32	72	14	58	58
	B	46	47	45	45	6	31	72	12	57	57

TABLE 2. DIFFERENCES OBTAINED OVER RANGE OF WIRES

	GR-S 40 P.H.R. CB	GR-S 60 P.H.R. CB	GR-S 80 P.H.R. CB	GR-S 100 P.H.R. CB	70/15/15 BD/CyanoBD/S	Perbunan 18	PolyBD	Geon 202	Natural Rubber (Tread Recipe)	Natural Rubber (Gum Recipe)
Degrees of twist	47	78	100	119	88	59	47	50	35	19
T_2, °C.	11	8	6	10	6	1	10	3	3	27
T_5, °C.	1	4	7	9	5	2	6	4	3	6
T_{10}, °C.	0	2	5	4	3	2	4	4	2	6
T_{100}, °C.	4	2	4	5	4	2	3	6	3	3
F. P., °C.	6	4	6	4	9	7	5	17	5	5

TABLE 3. DIFFERENCES BETWEEN VALUES OF YELLOW AND GREEN WIRES

	GR-S 40 P.H.R. CB	GR-S 60 P.H.R. CB	GR-S 80 P.H.R. CB	GR-S 100 P.H.R. CB	70/15/15 BD/CyanoBD/S	Perbunan 18	PolyBD	Geon 202	Natural Rubber (Tread Recipe)	Natural Rubber (Gum Recipe)
Degrees of twist	15	25	34	34	26	19	14	15	10	5
T_2, °C.	−3	+1	+1	+2	0	−1	−1	+1	0	+8
T_5, °C.	0	0	−1	+4	+2	0	−2	+1	−1	+5
T_{10}, °C.	0	0	−3	0	+2	+1	−1	+2	−1	+4
T_{100}, °C.	−2	−2	−4	−2	−1	−1	−1	−5	−2	+1
F. P., °C.	−1	0	−4	−2	+1	0	0	+7	+1	+3

Results and Discussion

Table 1 shows the actual test data obtained with each of the five wires. It will be noted that, although the Shore durometer readings have a range of 54 units, the angular degrees of twist at 25° C. with the white code (stiff) wire cover a range of only 19 degrees; whereas the green and yellow code wires have ranges of 86 and 57 degrees.

Table 2 indicates the range obtained in Gehman values (T_2, T_5, T_{10}, T_{100}, and F.P.) for each polymer with the five grades of wires. By extending the straight portion of the Gehman curve through the abscissa of the plot, a value is obtained at the point of intersection arbitrarily called the freeze point, F.P. Except for T_2 values, the greatest temperature range is noted with the Geon 202 stock; whereas the natural rubber tread stock provides fairly consistent data regardless of the stiffness of the wire.

Since practically all laboratories have either the yellow or the green code wire, Table 3 was compiled to show what differences might be expected between these two wires. For other than plastic materials, the differences in values are relatively small and of little consequence. From these data it appears that either the green or the yellow code wire might be used as a standard. However, since many of the laboratories have adopted the yellow code wire and because the range in twist (120 to 170 degrees) of the yellow code wire at room temperature would include a greater variety of specimens, it is suggested that this wire be adopted as the standard.

Figure 2 shows a typical set of curves obtained with each of the five wires using a natural rubber tread-type compound for test specimens.

Summary and Conclusions

The yellow code wire (torsional constant, 0.500-gram-centimeter per degree of twist) appears to be the best of the five wires for standardization purposes. However, if with this wire the specimen twists through more than 170 degrees at 25° C., the black code wire should be used, and this deviation from standard procedure reported.

Likewise, a specimen which twists less than 120 degrees at the temperature of 25° C. with the yellow code torsion wire should be tested with the white code torsion wire.

Recent Developments in the Field of Compounding in 1950

A. E. Juve[1]

DURING 1950 a variety of new compounding materials became available to the compounder further to complicate his task. While the present-day compounder might look back with nostalgia to the "good old days" when only one rubber was available and only one carbon black, those limitations in materials also meant a limitation in the variety of jobs which the compounder could accomplish. Today's much wider applications of rubber products, their better quality and lower cost are, in great measure, the result of the wide variety of materials now available to the compounder.

This brief review will attempt to describe the new materials which became available during 1950. In many cases the products mentioned may have been announced some time prior to 1950, but in nearly every case the product became available on a commercial basis in 1950 or established a place for itself during that year.

Polymers

Last year a total of about 80 experimental polymers of the GR-S type was produced in the government synthetic plants, a majority of which represented minor modifications in composition or process. Although no radically new polymers were made available, many of those which were made represented adjustments in composition, viscosity, etc., designed to do some specific job better. One change which resulted from the acute shortage of styrene was the reduction, during the year, of the combined styrene in the standard GR-S grades from about 23% to about 20%.

"Normal" smoked sheet classified into nine grades based on the French proposal became avaliable in commercial quantities. The classification depends on segregation of lots of rubber based on two properties, viscosity and curing rate. For each viscosity level there exist three curing rates (slow, medium, and fast), and for each curing rate are available three levels of viscosity (low, medium, and high), making the total of nine grades.[2] This breakdown represents a major effort to provide the industry with one of its principal raw materials classified on the basis of technical considerations instead of visual grading. At present these classifications do not displace the conventional grading methods, but are superimposed on them.

Although introduced prior to 1950, natural rubber containing a peptizing agent, Pepton 22, added to the latex at the plantation became available in commercial quantities last year.

There was relatively little activity during the year in the field of the special-purpose polymers, although new silicone polymers were introduced which are substantially improved over their predecessors with respect to the physical properties of their vulcanizates. The extremely low brittle temperature of these materials combined with excellent heat resistance have stimulated much interest in them.

Pigments

The HAF blacks are by now an old story. During 1950 several manufacturers developed grades which match closely the properties of the previously accepted standard HAF grades. The only new black to make its appearance was a finer particle furnace black designated as SAF (super abrasion furnace) which has a surface area in the same range as the HPC blacks. This became available in pilot-plant quantities, and factory tests are now under way to evaluate its potentialities.

Hi-Sil, a hydrated SiO_2 pigment having a particle size in the range of EPC black, was announced in 1949, but reached commercial production in 1950 and has become established as the best of the non-black reinforcing pigments available in this country.

Rubber Chemicals

Four non-staining antioxidants reached commercial production during 1950: Wingstay S, produced by Goodyear Tire & Rubber Co.; American Cyanamid Co.'s #2246; Monsanto Chemical Co.'s Santowhite L; and Stabilite White, marketed by C. P. Hall Co. These materials are of particular interest because they represent a class of chemicals quite different from that to which the more standard age resisters belong.

A new flex resistant antioxidant, Akroflex F, was introduced by E. I. du Pont de Nemours & Co., Inc.; and an antioxidant which also imparts some ozone resistance, Santoflex AW, was also introduced by Monsanto.

Sulfasan R [N,N' dithio bis(morpholine)] has been made available in semi-commercial quantities by Monsanto. This is a material which may be used as a curing agent or as a source of part of the sulfur required for cure and which exhibits, in suitably balanced recipes, extremely long-delayed action times.

A liquid, fast-curing accelerator for latex use was announced by Sharples Chemicals, Inc., under the name, Merac.

An amine-type activator, designated Aktone, was placed on the market by J. M. Huber Corp., and an activator for butyl cures, called Vulklor, was introduced by Naugatuck Chemical Division, United States Rubber Co.

An accelerator for neoprene cures, NA-22, was also introduced by du Pont.

Miscellaneous Materials

A variety of materials not classifiable in the above categories, but of interest to the compounder has also

[1] B. F. Goodrich Research Center, Brecksville, O.
[2] See also India RUBBER WORLD, May, 1950, p. 176.

become available during 1950. Among these are:

A new rubber-to-metal adhesive called Kalobond RM-2 (The General Tire & Rubber Co.).

Several new and improved grades of Silicone and Silastic mold lubricants.

A mold finish based on Teflon, available in field test quantities.

A host of softeners and plasticizers.

Latex Industry

George R. Vila[3]

DURING the entire year 1950, latex consumption in the United States continued the spectacular acceleration rate which began during the last quarter of 1949. As a result, latex of all types, and particularly *Hevea*, were in critically short supply, and *Hevea* rose in price from 25.73¢ in January to 84.20¢ in December, on a dry weight basis.

The participation of the major types in this boom and trends in consumption over the past five years are shown in the following table.

LATEX CONSUMED IN THE UNITED STATES

(Long Tons—Dry Solids Content)

Year	Hevea	GR-S	Neoprene	Total
1946	5,724	24,810	13,603	44,137
1947	13,909	22,474	6,087	42,470
1948	28,489	23,441	4,500	56,430
1949	36,110	21,500	3,750	61,360
1950	56,140	23,680	2,530	82,350

It is evident from these data that the big surge occurred in *Hevea* latex, and this in turn may be ascribed to foam sponge coming of age not only in mattresses, but in automotive seat cushions, pillows, and upholstery.

The very strong demand for *Hevea* in sponge was superimposed on an accelerated demand for all kinds of products made from latex. The result was an almost unprecedented disparity between supply and demand.

The steep climb in the price of *Hevea* latex came as a distinct surprise to many who had assumed that the giant synthetic rubber industry would have dampened gyrations of this magnitude. A study of the price movements of the year, however, gives testimony to the shortcomings of "hot" GR-S latex as an adequate replacement for the natural latex where film strength is a paramount consideration.

A result of this situation was a sharp spurt in interest on the part of the industry in the potentialities of cold GR-S latex as a replacement for natural. The progress made in the polymerization and utilization of cold GR-S latex is perhaps the most significant development of the year on the technical front.

Although cold GR-S latex was first produced commercially in June, 1949, interest was comparatively dormant until the shortage of *Hevea* latex became acute, and prices began to skyrocket.

During 1950 the industry learned to use cold GR-S latex as a 100% replacement for *Hevea* in many cases in foam sponge, dipping tire cord treatment, and various coating and saturation applications.

The supply of cold GR-S latex has been very limited, but important expansions are now under way, and by the end of 1951 larger quantities will be available.

[3] General sales manager, Naugatuck Chemical, U. S. Rubber, Naugatuck, Conn.

Additional Experimental GR-S Polymers and Latices

THE table below gives the additions and changes in the list of experimental GR-S polymers and latices authorized by the Office of Rubber Reserve, RFC, from March 23 to May 24, 1951.

Normally, experimental polymers will be produced only at the request of the consumers, and 20 bales (one bale weighs approximately 75 pounds) of the original run will be set aside, if possible, for distribution to other interested companies for their evaluation. The 20 bales, when available, will be distributed in quantities of one bale or two bales upon request to the Sales Division of Rubber Reserve, or will be held for six months after the experimental polymer was produced, unless otherwise consigned before that time. Subsequent production runs will be made if sufficient requests are received.

These new polymers are experimental only, and ORR does not make any representations or warranties of any kind, expressed or implied, as to the specifications or properties of such experimental polymers, or the results to be obtained from their use.

X-NUMBER DESIGNATION	POLYMER DESCRIPTION
	Changes in Previously Announced Polymers
X-431 GR-S	Stabilizer changed to read 1.25 parts Wingstay-S.
X-547 GR-S Latex	Shortstopped with potassium dimethyl dithiocarbamate or dimethyl ammonium dimethyl dithiocarbamate.
X-600 GR-S	Mooney viscosity changed to 40±5 (ML-4).
X-618 GR-S	Polymerization temperature, 46-50° F.
	New Polymers and Latices
X-634 GR-S	Butadiene/styrene charge ratio 75/25 adjusted to give 20±1% bound styrene; polymerized at 41° F. emulsified with Dresinate 214 or 731; catalyzed with diisopropylbenzene hydroperoxide or equivalent; iron-pyrophosphate activator. Shortstopped with DNCB; stabilized with 1.25% BLE. Mooney viscosity, 52±6.
X-635 GR-S Latex	Same as X-633 GR-S Latex, except butadiene/styrene charge ratio 70/30; solids content, 60.0-63.0%; and Mooney viscosity of contained polymer (ML-4 @ 212° F.), 70-110.
X-636 GR-S	Same as X-597 masterbatch except bound styrene content of the non-pigmented polymer is 20±1%.
X-637 GR-S	Butadiene/styrene charge ratio 75/25 adjusted to give 20±1% bound styrene; polymerized at 41° F.; emulsified with Dresinate 214 or 731; catalyzed with diisopropylbenzene hydroperoxide or equivalent; iron-pyrophosphate activator. Shortstopped with sodium dimethyl dithiocarbamate and sulfur as sodium polysulfide. Stabilized with 1.25% Stalite. Mooney viscosity, 52±6.
X-638 GR-S	A masterbatch of 15 parts Philblack 0 and 100 parts of the non-pigmented polybutadiene in X-584.
X-639 GR-S	Same as GR-S-26 with 20% bound styrene and shortstopped with sodium dimethyl dithiocarbamate and TEPA or Polyamine H.
X-640 GR-S	Same as GR-S-60, except butadiene/styrene charge ratio adjusted to give 20±1% bound styrene; shortstopped with sodium dimethyl dithiocarbamate and sulfur as sodium polysulfide; and stabilized with 1.25% Wingstay-S.
X-641 GR-S	Same as GR-S-10, except activated with Redsol.
X-642 GR-S	Similar to GR-S-100, except polymerized at 48° F.
X-643 GR-S	Similar to GR-S-100, except polymerized at 48° F., and butadiene/styrene charge ratio adjusted to give 16.5±1% bound styrene.
X-644 GR-S-AC	Similar to GR-S-30AC.

A Review of the Mechanism of Flex-Cracking and Flex-Cracking Tests—II

J. M. Buist[1] and G. E. Williams[1]

THE following installment continues the review on information in the literature on flex-cracking, undertaken by the authors following suggestions on this need made at the 1949 ISO/TC/45 meeting. The complete paper, presented at the 1950 ISO/TC/45 meeting, is being published here in three parts; this is the second installment.

Errors of Test

Three important aspects must be considered in a discussion of the accuracy of testing, and these seem to be often confused. These three aspects are: (a) the accuracy of the *measurement* of flex-cracking resistance of any one sample; (b) the degree of reproducibility of the *test conditions;* (c) the degree of reproducibility of the *test specimens.*

The method of determining the flex-cracking resistance suggested by Newton (*22*)[2] gives a standard error for the measurement of the flex-cracking resistance of one test sample of only 3½% of the number of cycles required to produce the standard state of breakdown. Measurements of the variation due to the other two sources were not made, but the standard error due to all three sources combined was 23%. Thus for this method the variation due to error of measurement was much smaller than that due to the other two combined.

Of the many published descriptions of flex-cracking tests only a few enable an estimate to be made of the amount of variation present in the results, and even then the estimate is that of the combined errors due to at least two of the sources outlined above.

The figures which have been published by various authors are summarized in the table below.

Only the results of Sturtevant and Newton are based on a large number of replicate observations. Sturtevant's figure of 16.4 in the fourth column is much larger than the two preceding results obtained on the same test, and this fact tends to throw doubt on all the estimates of error based on only a small number of replicate observations. This point illustrates the somewhat unsatisfactory nature of the data which can be found in the published literature.

From the point of view of practical testing, the figures given in the eighth column are the most important. In all cases these figures are much larger than those given in the sixth and seventh columns, which indicates that the errors due to the lack of reproducibility of the test samples are more important than those involved in testing samples. Recent work (*28*) has confirmed that similar effects are obtained with tests on the du Pont machine.

A simple graphical method of treating flex-cracking results has been devised (*28*). This involves adjustment of graphical scales in such a manner that the progressive cracking of the test samples in one experiment is represented by near straight lines. The slopes of the lines are then used to obtain relative figures for both the time to develop pinholes (which can be called crack initiation time) and the time for the propagation of the cracks from the pinholes to a specific degree of cracking.

Effect of Modification of the Test Environment, Test Conditions, and Method of Sample Preparation

In this section the various factors are considered under four headings.

Atmospheric Factors Applying before or during Test

Atmospheric factors include the effect of oxygen, ozone, light, outdoor exposure, water vapor, and contact with oil. A tremendous amount of work has been done on ozone cracking and atmospheric cracking. There is little doubt that in service, and in laboratory tests, these factors may be responsible for the initiation of small cracks even before flexing has begun, as mentioned by Rainier and Gerke (*17*).

There is also no doubt that these factors play a part in the growth of cracks during flex-cracking [e.g., the effect of oxygen on flex-cracking shown by Neal and Northam (*25*)].

In fact, although it is possible to consider static cracking without reference to dynamic cracking, it is impossible to consider flex-cracking without also considering static cracking.

[1] Imperial Chemical Industries, Ltd., Manchester, England.

[2] Numbers in parentheses refer to Bibliography items at the end of this installment. For references 1-32 see our June, 1951 issue, p. 322.

ESTIMATES OF VARIATION IN FLEX CRACKING RESULTS

(From Published Literature)

Authors	Method of Test	S. D. of Single Observation: Source of Variation (a)	(b)	No. of Observations Used	S. E. of the Mean Result for One Sample: Source of Variation (a)	(a, b)	(a, b, c)	No. of Samples Used
Depew and Jones (33)	Scott belt	....	5.0	4	....	2.5	6.6	3
Gibbons (34)	Scott belt	....	5.9	4	....	3.0	8.1	19
Sturtevant (35)	Scott belt	....	16.4	56	....	4.2	....	..
Gray, Karch, Hull (9)	Tire test	....	13.1	12	....	3.8	11	10
Depew and Jones (33)	"Free bend" test	....	5.0	3	....	2.9	....	..
	"Jerking" test	....	2.7	3	....	1.6	....	..
Rainier and Gerke (17)	Modified DeMattia	....	....	..	....	....	16	18
Newton (22)	DeMattia	11.6	....	80	3.5	....	23	50

The amount of information available on static cracking is so voluminous that it has been impossible to review it fully, but it has been very well summarized by Dufraisse (36). In short, atmospheric cracking appears to be due to oxidation of rubber accelerated by light or to the action of ozone when the rubber is slightly stretched.

For both atmospheric cracking and ozone cracking, the rubber must be elongated; the maximum cracking should correspond to an elongation of about 10%, or to a stress of 1 kg/cm².

To this point must be added the very fine research into atmospheric cracking by Newton (37) showing that the number of cracks depends on the relative rates of crack formation and crack growth and also showing very convincingly that atmospheric ozone (together with stretch) is the active agent.

Several classical papers deal with the effect of atmospheric factors on flex-cracking.

Neal and Northam (25) carried out flex-cracking tests (with natural rubber) on a small enclosed du Pont belt-flexing machine. They say that three causes of failure have been proposed; mechanical fatigue as opposed to failure produced by cutting or chaffing by compounding ingredients; oxygen; ozone.

They carried out tests in oxygen, air, and nitrogen and found:

There is no great difference between tests in oxygen and those in air. This is explained by the fact that even in air the oxygen concentration is sufficient to give the maximum rate of cracking. Shelton and Winn (38) find with GR-S that the critical oxygen content is about 0.3% by volume, and slightly higher concentrations give results comparable to those in air. Le Bras and Salvetti (39) have measured the oxygen absorption of rubber during flexing and find that the rate of oxygen absorption is unaffected.

Neal and Northam considered that if mechanical fatigue were responsible for flex-cracking, concentration of oxygen or ozone would not affect flex-cracking, and from the above results they conclude that "flex-cracking is due to oxidation rather than mechanical fatigue."

The above phrase is very widely quoted, but it should be noted that Neal and Northam have not by any means proved that oxidation is the sole factor in flex-cracking, even though it may be the main one in absence of antioxidant. The first statement in the above paragraph would only be true if fatigue were the sole factor in flex-cracking. What these authors have proved is that oxidation is a factor; but they have not proved that fatigue is not a factor.

Neal and Northam also state that the suggestion that cracking is due to ozone is based on the fact that when rubber is flexed rapidly, an electric charge can be detected which might be sufficient for the production of ozone, and also on the similarity of appearance of ozone and flex-cracks.

Tests made in ozonized air showed that phenyl-b-naphthylamine gave no protection against ozone.

Ozone produced surface cracks, but not true flexing-cracks. The true flexing cracks were no worse than without ozone [see Rainier and Gerke (17) and Eccher (27)].

During their tests Neal and Northam attempted to detect ozone produced by flexing, by means of a piece of rubber stretched to 15%, held within one centimeter of the belt at the point of flexure at the pulley. This test is stated by several workers to be the most sensitive for ozone. No cracking of the strip of rubber was visible after 40 hours; so Neal and Northam concluded that no ozone is produced by flex-cracking in air [but see Eccher (27)]. In confirmation of this statement tests indicated that the charge produced was comparatively small, and a much more rapid flexure than given by this machine would be required to produce ozone.

Rainier and Gerke (17), in attempting to produce a test which would give repeatable results and correlate with service, considered that it would be useful to eliminate the induction period present in flex-cracking tests. Variations in the time required for crack initiation was, they opined, partly responsible for the errors of flex-cracking tests. In their test, cracks were initiated by ozone before the test began, and a method of rating was used which gave results independent of the extent of cracking initiated. Rainier and Gerke claimed that this procedure initiated the cracks which soon appeared in tires in service, before flex-cracking had begun, and which van Rossem and Talen (40) considered due to ozone.

This opinion was strengthened by the similarity of appearance of ozone and flex-cracks, and in their test, Rainier and Gerke found that ozone-cracking and flex-cracking were additive and could be used interchangeably to initiate cracks without affecting the results of the test.

Eccher (27) has concluded as a result of a striking series of experiments that ozone plays an important part in crack initiation. After confirming some previous results, such as Cooper's observation that the greater the extension, the more rapid the cracking, Eccher found that the deepest cracks, both on ring and trapezoid specimens, corresponded to a minimum elongation of 10%. This value corresponds to the critical elongation of rubber exposed to ozone. By increasing the minimum elongation above a definite limit the life was increased enormously, as found by others (see later). The cracks were observed by microscopic examination (X80).

After flexing there were numerous tiny cracks, uniformly distributed and not always visible to the naked eye; and a few relatively large deep fissures, irregularly distributed.

All cracks and fissures were perpendicular to the direction of elongation apart from a few exceptions due chiefly to marks made on the specimen. In general, but not always, the small cracks appeared before the fissures formed. Various facts led to the conclusion that these small cracks were caused by ozone. Neal and Northam referred to ozone, but could not detect it. Stretched specimens were exposed to ozone, but the concentration used by previous workers was considerably reduced to 1:1,000,000 so that the time taken would be the same order as that of mechanical tests, and the mechanism would be more like that of natural cracking, e.g., in the effect of speed of migration of protective agents. Variations in the concentration of ozone had a big effect.

The main results leading to the conclusion that ozone played a part in flex cracking were:

Cracks made by ozone and by flexing had an identical appearance.

The time for cracks to appear with different agents placed the rubbers in the same order, whether caused by flexing in the Pirelli or DeMattia machines, or by ozone.

Although Neal and Northam failed to detect ozone, an ozone indicator was incorporated into a sample of rubber and was found to have changed color on the surface after flexing.

A rubber ring was flexed by being rolled round an annular space between a metal ring and a rotating

metal cylinder. When the machine was earthed, the ring cracked much more rapidly than when the machine was insulated. If this result is confirmed, it opens up the question of the effect of conductivity of rubber on its flex-crack resistance.

All the above observations are sufficiently interesting to require verifying.

Bridgwater (41) found that Duprene (Neoprene) did not crack under normal atmospheric conditions and was much less subject to corona checking than natural rubber. Duprene was satisfactory after 80 hours on a du Pont belt-flexing machine, whereas natural rubber cracked after 14 hours.

Some unpublished work carried out by Newton and Buist should also be noted. Newton carried out some flex-cracking and cut growth on samples kept moist by glycerine. He has found that atmospheres of concentrated ozone do not cause cracking of stretched rubber kept wet. The results of the tests were conflicting in the sense that flex-cracking was unaffected by the glycerine, but cut growth was significantly retarded.

It is generally accepted that the only means of providing protection against ozone cracking is for the rubber to contain a reservoir of wax which blooms to the surface or to coat the rubber with a flexible ozone resisting lacquer. Buist has found that test pieces coated with a Vulcaprene lacquer are more resistant to crack initiation than the same mix which has not been lacquered. The reason why blooms are not effective in delaying flex-cracking is most probably due to flexing breaking the continuous wax film. In these circumstances cracking may be more severe at localized spots where the wax film has been broken. This fact is confirmed by Powell and Gough's view (42) that the delay in cracking produced by a protective film must equal the normal operational life of the rubber article as once cracks are formed, they have conditions which encourage maximum rate of development.

Fatigue

Fatigue indicates purely physical changes in the sample which take place as it is worked. The part played in flex-cracking by fatigue, as opposed to oxidation or ozone, has been shown chiefly by the work of Naunton and his co-workers in the three papers, "Fatigue in Rubber, Parts I, II and III."

In Part I (2) a reasonable prediction of du Pont belt-flexing life of various antioxidants was given by the formula:

$$F = \frac{K}{T_o - T} - af$$

where F is the flexing life, $(T_o - T)$ is the drop in tensile strength on aging, and K is a constant. "f" is a measure of the torsional frictional loss, and "a" is a constant.

It was shown that fatigue originated largely in frictional losses near zero elongation, and that flex-cracking life was improved by preventing the sample from returning to zero strain in each cycle.

In Part II (3) it was shown that both in rubber and neoprene black compounds the modulus was lowered 10-15% by fatigue.

In Part III (4) an equation similar to that of Part I was used to give a reasonable correlation with life on the Vogt machine over a series of fillers in a range of loadings. This paper was concerned with a consideration of the two factors, fatigue and reinforcement, so often found in opposition in the design of rubber compounds.

Parkinson and Bloxham (36) have used the Dunlop fatigue machine (43) and find that fatigue resistance is influenced positively by the reinforcing action of the carbon black and negatively by its adverse effect on resilience. The indications are that carbon black particles in the range 48-80 m.μ. are likely to give the greatest resistance to fatigue under constant work conditions. The effect on fatigue of carbon structure superimposed on that of particle size will influence the results to a degree not yet determined. These conclusions agree with results obtained by Juve (6), who compared the crack growth (DeMattia) and heat build-up (Goodrich flexometer) of GR-S vulcanizates.

The effects of flocculation of blacks, and of anti-flex cracking antioxidants have been confirmed by Mackray, Anderson, and Gardner (44), and the effect of heat and remilling in increasing the resilience and electrical conductivity has been confirmed by Parkinson (45).

In all this work the problems were made difficult, and the conclusions doubtful by the magnitude of the errors in flexing tests; in fact the main conclusion was that the reproducibility of flexing tests must be improved before further work would be profitable.

Bibliography

(33) *Rubber Age (N. Y.)*, 27, 369 (1930).
(34) *Ind. Eng. Chem. (Anal. Ed.)*, 2, 99 (1930).
(35) India RUBBER WORLD, 84, 4, 61 (1931).
(36) "Chemistry and Technology of Rubber," p. 440.
(37) *J. Rubber Research*, 14, 27, 41 (1945).
(38) *Ind. Eng. Chem.*, 37, 67 (1945).
(39) *Rev. gén. caoutchouc*, 26, 10 (1949).
(40) *Kautschuk*, 7, 79 (1931).
(41) *Ind. Eng. Chem.*, 26, 33 (1934).
(42) *Trans. Inst. Rubber Ind.*, 21, 102 (1945).
(43) V. E. Gough, D. Parkinson, *Ibid.*, 17, 168 (1942).
(44) *Ibid.*, 16, 123 (1940).
(45) *Ibid.*, 16, 87 (1940).

(To be concluded)

Hevea Scarce in Brazil!

News from Brazil continues to stress the crude rubber shortage and the resulting difficulties to rubber goods manufacturers. So far this year tire manufacturers twice gave "vacations" to employes because there was not enough rubber to keep going. During 1950, only 23,922 tons of raw rubber were produced here, against 27,256 tons in 1949; the 1950-51 rubber harvest, which started last September, is expected to reach 29,500 tons. But even this amount is held far short of actual needs, and Brazil must import *Hevea* rubber from the Far East!

In view of this scarcity the fixing of ceiling prices, even at the enhanced rate of 22.70 cruzeiros per kilogram for fine Para, seems to have encouraged smuggling. The attention of the government and of the Amazon Credit Bank has been called to the smuggling of Brazilian rubber across the Bolivian frontier from nearby rubber areas. It is stated that small river traders pay as much as 30 cruzeiros per kilogram for any *Hevea*, which is shipped by plane to La Paz, Bolivia, and thence to its final destination, Argentina.

Meanwhile the government is encouraging the collection of wild rubber by offering various inducements, but it is also reported planning extending plantations in the Amazon Valley and along the Guama River, in Para. Steps have also been taken to attract workers to the former Ford plntations at Belterra to increase production there, and pirvate planters in South Bahia will be given financial and technical assistance to improve and extend existing plantations. One million trees have been planted in the Bahia area, and enough suitable land is available for about 20,000,000 more trees in this region.

Editorials

A Step in the Wrong Direction?

WE MADE the statement in this column last month that "the newly developing world rubber situation calls for the minimum of controls in order that the rubber industry may continue to achieve its primary goal—operation at a profit to its stockholders, management, and workers."

Recent statements by the heads of some of the Washington agencies concerned with rubber have indicated that they believe some relaxation of government controls may be possible during the latter half of the current year. Some other agency officials have professed the belief that the rubber stockpile situation is still critical and infer that tight controls are necessary for some time in order that every pound of natural rubber possible can be put into this stockpile.

It is pretty well known throughout the industry that natural rubber stockpile requirements have had to be recalculated several times recently, and one of the reasons for these recalculations was the very high and very unrealistic original requirements of the Armed Services. Another was the lack of appreciation of the reduction in natural rubber content which was possible in many items; yet without any sacrifice of service life.

An instance which has come to our attention recently, where the trend is toward more instead of less controls and more instead of less demand on industry for nonproductive effort in connection with the government rubber program, is the introduction of the new forms NPAF-58 and NPAF-59.

The rubber division of the National Production Authority agreed to make allocations of new rubber on a quarterly instead of a monthly basis beginning July 1. This action had been recommended by the industry. At the same time, however, the NPA instituted these new forms to be filled out by rubber goods manufacturers in advance of the granting of their quarterly allocations. NPAF-58 asks that the manufacturer show for 32 transportation products coded the same as in Appendix A of Order M-2, the units or quantity scheduled for production in the next quarter as original equipment for military and civilian use and for replacement and export for military and civilian use. Also, on the same form, rubber consumption for each of these items must be estimated in pounds of dry natural rubber, dry weight of natural latex, GR-S, GR-I, neoprene, and nitrile types and "Thiokol," whatever the case may be.

NPAF-59 asks for the same information for 29 nontransportation products including belting, hose, wire and cable, soles and heels, footwear, shoe products, latex foam, drug sundries, etc.

The use of these new forms probably means that together with many other forms that must be filled out at regular intervals, the industry will be devoting more manhours to collecting and reporting data to the government than at any time in the past, even during the late war. The agencies will also, in turn, have to devote more manhours for the recording and analyzing of these data. Such procedure would certainly seem to be out of step with the times. Rising synthetic rubber production and the continued high level of production and availability of natural rubber would appear to make the allocation of both types of rubber unnecessary in the course of the next few months.

Furthermore, the use of these new forms, which mention appropriate penalties for giving false information, requires that the figures reported be sworn to by a responsible official of the company concerned. How can it be known whether the information is true or false when these data are requested in such detail that some of the figures cannot be considered as much better than well-intended guesses?

The deadline for the submission of the NPAF-58 and NPAF-59 forms for the first time was June 15. We have no knowledge of the number of companies able to meet this deadline. But is it necessary or even desirable to burden the industry with the additional work and cost required to complete these forms along with the work recently done in connection with the calculation of rubber product price ceilings, in view of the present and future rubber supply picture?

Of course the information reported will be of value statistically, but the rubber industry is likely to have a rougher time than ever before if the various government agencies are going to be able to ask for any and all types of information they believe to be of interest in connection with their control of the industry and if these agencies also have the legal authority to obtain such information.

It has been stated that the declared policy of our country is for government controls only to the extent necessary for national security, and in favor of business operations by free private enterprise. We cannot see how the use of the above-mentioned new forms adds anything to or is necessary for national security. Their continued use, however, will certainly make it more difficult for the rubber industry to "achieve its primary goal—operation at a profit to its stockholders, management, and workers."

R. G. Seaman

DEPARTMENT OF
PLASTICS TECHNOLOGY

Masking Problems in Manual and Automatic Spray Painting of Molded Plastic Parts[1]

Hamilton E. MacArthur[2]

THIS paper will briefly discuss the techniques which can be applied, and some of the masking problems involved, in the single and multi-color decoration of plastic parts by means of a spray gun and using metal electro-formed masking shields to confine the paint to the desired area. The presentation will not discuss the well-known and long-established practices of masking with tape and die-cut adhesives, or decorating by means of silk screening, hot stamping, printing, rolling, and use of hand-worked sheet-metal masks.

It has been reported that 85% of all organic coating applications are spray applied, and we should hazard the estimate that an equally high percentage of all types of coatings on plastics are likewise applied by spraying. Whereas metal, wood, and other materials are frequently coated for protective reasons, the great majority of plastic coatings is applied for either design legibility or decorative effect. In other words, the coatings provide eye appeal and sales appeal.

As a consequence, the accurate, rapid, and economical color decoration of plastics is of prime importance. The adherence of paint, tonal strength of color, loss of gloss, crazing, toxicity, drying time between successive colors or coatings, etc., are likewise highly important considerations which, however, are not treated in this paper. These are only a few of the problems which must be resolved between the molder and/or decorator, the plastic raw material supplier, and the paint supplier.

Let us examine the mechanics of spray painting with rigid, durable electro-formed metal shields. The economical repetitious painting of like parts demands a masking shield that (1) has accuracy of form and provides a snug fit over any shape or contour; (2) has sufficient strength at its work edges to produce sharply defined color separation lines; (3) is sufficiently durable to prove capable of repeated use and repeated cleanings; and (4) is capable of being rapidly fitted and removed from the part.

It appears that the electro-formed metal mask, electrolytically formed upon the specific molded part, meets all these requirements. Unfortunately, however, technically strict observance of these requisites with any given part does not necessarily give the desired production result on the whole run of parts. The mask maker cannot be just a good mechanic, but must have some knowledge of spraying techniques to design properly a workable tool.

[1] Presented before national technical conference, Society of Plastics Engineers, Inc., New York, Jan. 20, 1951.

[2] Treasurer and general manager, Conforming Matrix Corp., Toledo Factories Bldg., Toledo 2, O.



Fig. 1. Lip-Type Mask Protects Embossed Area during Painting

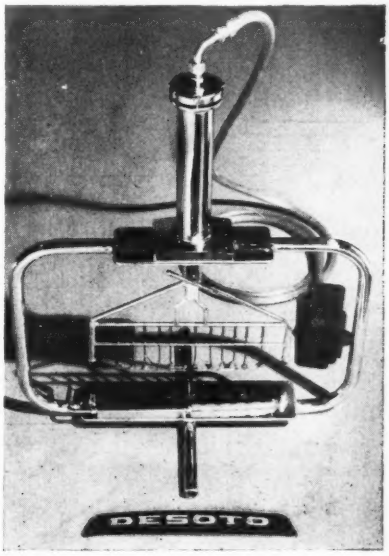


Fig. 2. Plug-Type Mask over Letters Prevents Leakage While Background Area Is Being Sprayed

What is of concern to many in the plastics industry is the actual unit production cost of spray decorating 10,000, 50,000, or even 1,000,000 pieces. It becomes a matter of real concern when a part costs 1¢ to mold and 2¢ to decorate. This cost ratio is not very unusual; in fact, painting costs three times the cost of the molding frequently occur.

In such cases the use of various types of metal form-fitting masks can often be helpful. The term "form-fitting" is the key. It must be remembered that such form-fitting tools cannot be made from prints or models of the part. The tool must form-fit the production run parts, and this fit can only be accomplished by electro-

forming metal into and upon such pieces. Tolerances not exceeding 0.0005-inch are often required effectively to seal against sprayed paint. Automobile, radio, refrigerator, and television manufacturers usually demand such accurracy on their high priced decorative emblem and trim items. On the other hand, other less expensive consumer goods items will permit a variation of several thousandths of an inch from piece to piece.

Types of Electro-Formed Masks

Because the three general types of form-fitting masks have already been discussed in the literature, we shall define them only briefly.

Lip-Type Mask

Where a depressed design is to be painted, besides form-fitting the contours of the part the mask must have a "lip" of metal which extends down the sidewall of the depression in order to trap the sprayed paint in the depressed well. The extent of filling can be controlled within reasonable limits by the length or the depth of the lip. This same lipping principle is also employed where an embossed design is to be protected from the paint (see Figure 1). In this case the lip keeps clean the top and all, or as much as may be desired, of the sidewall of the embossing. In the first type of lip mask free sections, such as the center of the letter "O" or the numeral "8," are held in place by wire bridging. The same type of bridging is also employed to hold the cappings of embossed mask sections.

Plug-Type Mask

Where a depressed design is to be kept clean instead of painted, plugs suspended from wire bridging must fully fill such depressed areas to prevent paint leakage when spraying the background area (see Figure 2). The making of such masks, sufficiently durable for use in production runs, often requires considerable skill and a knowledge of the problems involved on the given part. When vacuum plating is a specified part of the design, plug-type masks are a must in order to protect the plating areas while color is sprayed on other sections of the part.

Block Cut-Out Plane Surface Mask

Where calibration lines or lettering, such as appear on many kinds of dials, are too small for practical individual masking, a cut-out area outlining a character or group of characters is more feasible from a rapid production standpoint. By confining the paint to a relatively small area, as shown in Figure 3, economies are achieved because fewer wiping or buffing passes are necessary to clean the pieces of excess paint.

Use of Painting Fixtures

Production can often be increased by using fixtures which position the piece snugly in the mask during painting. This need of fixtures depends on the nature of the piece and the extent of the area to be painted. In cases where paint must be stopped on a plane surface having no depressed or raised line of demarcation, the use of pressure fixtures is invariably a necessity. In addition, flimsy or large parts which tend to warp or otherwise depart from their intended form usually require such pressure fixtures. It is sometimes possible to utilize the same fixture with interchangeable masks for different color coatings on the same job, or even with different masks for different jobs.

Although spring, cam, or toggle locking devices are sometimes preferred, experience indicates that air-actuated pressure fixtures operated by a foot treadle are generally superior (see Figure 4). Use of such foot operated fixtures leaves both hands of the operator free for productive movements, thereby increasing the speed of handling. The desired pressure, furthermore, can always be maintained since the thrust of the piston compensates for variations in the wall thickness of the parts. In addition to this adaptability, air-pressure fixtures can usually be produced at less cost than comparable mechanical devices.

One illustration will serve to point up the advantages of proper tooling. Recently a company was molding a 16-inch clear plastic television window and painting a three-color border thereon. The customer, a television manufacturer, had been ill-advised in supplying lay-on masks for spray painting the three-color border. Because these masks did not seal the pieces tightly enough, with resultant need of considerable wiping, the best production rate obtainable was 350 painted pieces per eight-hour day. Later, with adequate tooling in the form of proper masks and air pressure fixtures, costing approximately $2,800, production was immediately raised to 750-800 pieces per eight-hour day. An additional saving was the elimination of one operator. A production increase of about 120% with one less operator is truly significant.

Masking Problems and Their Correction

The chief problem in masking is occasioned by the dimensional inconstancy of successively molded parts even under the best of conditions. Because several cavities are made from the same hob it does not necessarily follow that masks will be interchangeable on all the parts. These variations in dimensions may be in the order of thousandths of an inch, but a metal mask is not elastic. If the mask fits one piece perfectly and not another, nothing further should be required to prove a variation in dimension or, possibly, even form contour.

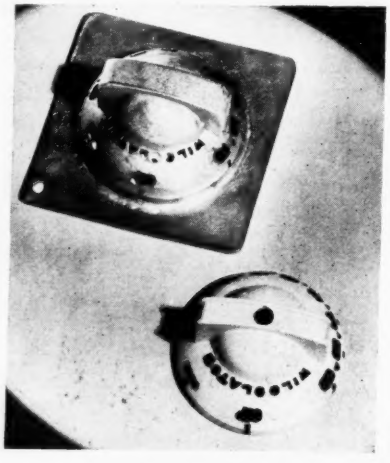


Fig. 3. Cut-Out Type of Mask Reduces Wiping Operations after Painting

Multi-color fine detail work, as seen on automobile and refrigerator emblems, invariably require sets of masks for each cavity. This probability must be considered in estimating finishing costs for similar fine work. Some firms heat cure the molded pieces to relieve stresses, avoid paint crazing, and insure a more uniform shape for better masking fits. With many other items, especially toys, however, sufficient latitude is usually permitted to allow the masks to be made so as to compensate for some variations in the molded pieces.

Unfortunately the dimensional variations apparently inherent in the material and manufacturing processes are more often than not further aggravated by other conditions. The mask maker fits the piece sent him; therefore, only good production run, approved parts should be utilized for mask making. Once the mask has been made, any of the following factors may defeat the best efforts of the mask maker: (1) changing the molding pressure, temperature, and/or cycle; (2) changing the molding material; (3) reworking or regating the mold; and (4) transferring the mold from one machine to another machine.

Frequently the design of the part in view of the particular color scheme to go on it makes for difficult and costly masking. While the molder and the color finisher usually have little control over this situation, slight changes in the mold to provide for good mask sealing and sequence of colors will often save many finishing dollars. It is encouraging to note that some industrial designers are aware of this difficulty and consult the mask maker before the part is put on the final drawings.

In general, the painting of small, intricate detail in a color contrasting with that of the immediate background should be avoided. If this avoidance is not possible, then the detail should be painted first so that following color masks can have openings wider than the actual paint separation line to permit more sprayings before mask cleaning. Even though the second color backs up on the first, this condition is not harmful as a rule. There are times, however, when painting small detail last is advantageous. Such is the case with metallic paints because they fog more readily than lacquers or enamels.

Still keeping the design of the part in mind, it is generally preferable on small pieces to paint any depressed or lower levels first, rather than the raised areas. Here lip-type masks are used, and spraying is from behind the sealing edge of the mask rather than against the sealing edge as occurs with plug-type masks. Nevertheless plug-type masks have their uses on small pieces, particularly where the depressed design in a clear plastic part must be kept clean for edge lighting, metallic spraying, or vacuum metallizing. On large parts plug-type masks are helpful because the plugs, being suspended from wires, can move slightly to compensate for dimensional variations.

Very shallow depressions having wide angle drafts are difficult to seal tightly with plugs. If possible, the depth of the depression should not be less than 1/32-inch so that the plug can have some body to it. If the design has several colors with at least two well separated, the masks can be made to permit spraying the second color immediately after the first and while the first is still wet. Automatic spray

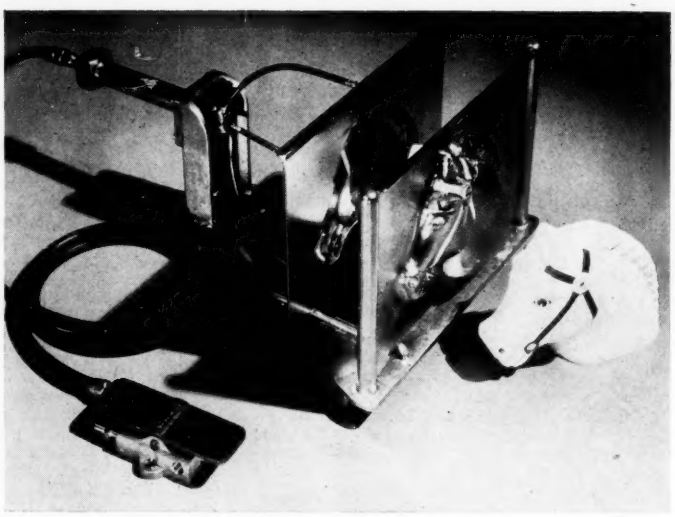


Fig. 4. Air-Actuated, Foot-Treadle Operated Pressure Fixture with Interchangeable Masks

painting machines are particularly advantageous for such operations.

Where toy animals and dolls are molded in halves which are then cemented together and painted front and back, it is highly important that dowel pins accurately aline the halves during the cementing operation. This alinement calls for well-designed cementing jigs because misalinement of the halves or a protruding cement seam will defeat good painting registration of the front and the back of the piece.

A word about the spray department is in order. Many plants look upon it as a necessary evil and treat it like an orphan. Many jobs are spoiled right in the spray department. Proper spray guns are one of the cheapest investments in good painting that can be made. The wrong gun for the job can waste many dollars in paint, increase the number of rejects, and cause unnecessary mask cleaning. The selection of the right gun, correct size of fluid tip, needle, and proper air cap, in accordance with the job at hand and the nature of the paint to be sprayed, will pay good dividends.

All jobs, moreover, are not to be sprayed with the same atomizing pressure and paint viscosity. In addition, there is no excuse for not determining and then maintaining the same viscosity on each subsequent batch of mixed paint for each job. The operator should not use a larger spray pattern than necessary to cover the work since, besides wasting paint, it will unduly load the mask. An unskilled operator can blow or flood paint past the best mask made; so we suggest that all operators receive some instruction in proper spray gun handling.

Automatic Spray Painting Machines

Automatic spray painting machines are not new, but have usually been built for a specific job or a limited number of jobs. Within the past year my company has placed on the market machines flexible enough to paint a variety of small parts on a mass-production basis. These machines are entirely operated by air and are hydraulically controlled. Spraying is from beneath and against the parts, while the electro-formed masks fit flush against the machine table, and the parts are loaded manually by the operator.

Spraying is automatic, but the speed of the cycle is controlled by a dial on the control panel. The rapidity of painting is readily adjustable to suit the nature of the part and the speed or skill of the operator. The operator loads with both hands, and production rates up to 3,600 pieces per hour are possible, although the down time for changing masks will reduce somewhat the total rate.

When parts require bridging to hold loose centers, shading will occur with guns held in a fixed position. To prevent such shading, one type of automatic machine revolves the masks 180 degrees or more during the painting operation. Where long parts are to be painted, such as automobile dashboard grilles or plastic television panels, another type of machine is available which travels the guns the length of the work during spraying (see Figure 5). Either one or two colors can be applied in both of these machines. A third type of machine has a rotary work table which indexes the parts to fixed positions for painting and can be used for applying one color to three colors.

Another feature of all the automatic machines is dial control of the length of time the guns are open. This control permits quick adjustment to get the desired amount of paint coverage. Once the gun pattern and the paint flow have been set by the supervisor, unskilled help can be used for loading and operating. In addition to production increases, considerable paint savings are also obtained. Since a variety of parts can be painted by merely changing the masks and resetting the guns, the machine does not have to be amortized on one job. One manufacturer using a rotary indexing machine reports painting 22 completed animals on both sides with three colors per minute. Here is three-color painting at a rate higher than 1,300 parts per hour.

Some machines have been privately built which incorporate washing of the masks after each use. My company is currently experimenting with such a development, but with the intention of having the machine be more adaptable than for one-purpose application.

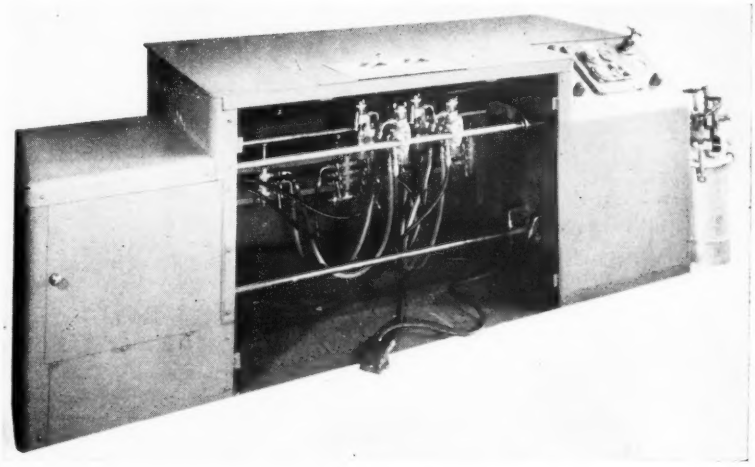


Fig. 5. Automatic Painting Machine with Guns Traveling the Length of the Work While Spraying

New Mold Lubricant

MOLD EASE CONCENTRATE PCR, a new water-miscible releasing agent for use in the molding of rubber, plastic, and ceramic articles, has been announced by Merix Chemical Co., Chicago 15, Ill. In addition, the new product can be used as an internal lubricant and color binder in ceramics and also as a non-oily, water-washable lubricant for metals. Since the lubricant does not leave an oily film, post-molding finishing operations can be started at once without the need of a degreasing treatment. Mold and die life is said to be prolonged because the product burns up with hardly any carbonaceous residue. The material is furnished in concentrated form and is diluted with water for use. The usual concentration for molding plastics is one part Mold-Ease to 10 parts water; one part Mold-Ease to seven parts water is the diluting ratio for rubber molding; and ceramics require a solution of one part Mold-Ease to four to six parts water.

SPE National Conference Plans; Section Reports

"PLASTICS Horizons" is the theme for the eight annual national technical conference of the Society of Plastics Engineers, Inc., to be held on January 16-18, 1951, at the Edgewater Beach Hotel, Chicago, Ill. The technical papers presented at the conference will examine the vital role of plastics in our present economy and in the national defense program. The conference will be sponsored by the Society's Chicago Section, which has set up a committee to handle all arrangements. John T. Bent, Tennessee Eastman Division, Eastman Kodak Co., is general chairman of the executive committee; Robert K. Gossett, Gossett & Hill, is co-chairman, and M. A. Self, Bee Chemical Co., is secretary.

The following sub-committee chairmen have been selected: speakers, Thomas Cleavener, Koppers Co., Inc.; printing, R. J. Linehan, Continental Plastics Corp.; program, Stanley F. Peters, Monsanto Chemical Co.; finance and budget, Charles Schiff, Breyer Molding Co.; house and banquet, Clarence McCormick, Superior Plastics Division, Commonwealth Plastics, Inc.; hotel (registration, reservations, and information), Maurice Meltzer, Service Plastics, Inc.; sergeant-at-arms, E. E. Eckenbeck, Jr., Midwest Plastics Products Co.; publicity, Ned H. Porte, General American Transportation Corp.; reception, Mr. Linehan; company registration and favors, Robert S. Stephens, Sobenite, Inc.; prize papers, John W. French, Ger-Ell Mfg. Co.; and ladies entertainment, Mr. Peters.

1951 SPE Prize Paper Contest

Henry M. Richardson, DeBell & Richardson, Inc., and chairman of the 1951 national prize paper committee, has announced that Carl J. Frosch, Bell Telephone Laboratories, Inc., will serve as chief judge in the third annual contest for which entries are now being received. The other judges are: Sven K. Moxness, Minneapolis-Honeywell Regulator Co.; George S. Nall, Jr., Nalle Plastics, Inc.; Herbert S. Spencer, Durez Plastics & Chemicals, Inc.; and Ralph K. Witt, Johns Hopkins University.

The national contest offers prizes totaling $350, while additional awards are being offered by the Society's local sections. As in previous years, all entries are to be submitted to the author's local section for judging. Winning papers in the local sections are then entered in the national contest, with national prize winners announced at the forthcoming SPE national technical conference in January. Rules for entries are simple, with no limit and little restriction as to subject matter except that the topic must pertain to the plastics industry. The deadline for submission of entries to the sectional contests is October 15.

Large Injection Machines

The New York Section, SPE, held its last regular dinner-meeting of the season on June 20 at the Gotham Hotel, New York, N. Y., with some 60 members and guests attending. Speaker of the evening was Frank G. Helander, Watson-Stillman Co., who discussed, "Large Injection Machines."

Mr. Helander noted that with the exception of the classic five-pound battery case halve made by Prolon Plastics, injection moldings during the World War II period from 1940-1945 were generally limited to a maximum of about 16 ounces, with the great majority being only four to five ounces in weight. Today injection moldings of 40-50 ounces are almost commonplace, and the industry is beginning to think of molding in terms of pounds rather than ounces.

The growth in Watson-Stillman injection machine shooting capacities started very slowly in 1937 and reached a 12-ounce size in 1940. In the war period the only change was to 16 ounces, but in 1945 and 1946 capacities surged upward to 22, 24, and 28 ounces. In 1948 the 28-ounce machine was superseded by the 32-ounce unit. In this year the first really large injection machine was introduced, the 40-ounce unit with 30- by 56-inch platens and 1,000-ton clamp. This 40-ounce machine, made especially for refrigerator work, had a relatively small daylight opening because of the large, shallow parts molded. In 1949 the first 48-ounce machine was produced for general-purposes use, particularly by the appliance industry.

The banner year for large machines was 1950 which saw 60-, 85-, 120-, 200-, and 300-ounce machines produced and shipped. The latter three machines are all equipped with preplasticizing units. There are many unexplored possibilities for good applications in large thermoplastic moldings. The probabilities are that a great many large parts will be made in the immediate future, Mr. Helander said, particularly in view of the following approximate list of large injection machines in actual operation in the United States at this time: 60 ounces, 33 machines; 80-120 ounces, 10 machines; 200 ounces, seven machines; and 300 ounces, two machines. Many increases in the number of the larger machines will be made this year.

Mr. Helander concluded his talk by discussing what can be expected in the next machines to be designed in sizes larger than the current 300-ounce unit. Indicated future requirements point to a machine having a larger platen area, possibly five by eight feet, a 3,000-ton clamp, and a shooting capacity of perhaps 900-1,000 ounces. The utilization of such machines will present a challenge to the molding industry and product designers.

Table favors were distributed through the courtesy of Nicholas V. Fasano, Washington Molding Corp., and the meeting closed with a drawing for door prizes contributed by Saul Blitz, Noma Electric Corp., and Sam Silberkraus, Riverdale Laboratories.

Plastics Problems Panel

An open panel discussion of some of the technical problems involved in the production of plastics featured the June 13 joint dinner-meeting of the Chicago Section, SPE, and Midwest Chapter, SPI. Some 100 members and guests attended in the Builder's Club, Chicago, Ill.

Subjects discussed included mold temperature control, high-frequency preheating, cleaning of extrusion equipment, and hopper loading for injection and extrusion machines. Panel members follow: William Gobielle, Nash-Kelvinator Co.; Robert C. Pelz, Victory Mfg. Co.; and Charles Karels, Service Plastics Co. Lee J. Swift, H. Muehlstein & Co., acted as moderator, and the program was arranged by Carl Massopust, General American Transportation Corp.

Following the technical discussion, Capt. W. J. Garry, Chicago Air Defense Filter Center, spoke on the city's air defense spotting system. It was announced that the groups would hold joint golf outings. Arrangements will be handled by a committee headed by Morris Meltzer, Service Plastics Co.

The first of three joint golf outings scheduled for this summer by the two groups was held June 15 at River Forest Country Club. Some 125 members and guests of the two groups participated in the outing, and more than 45 prizes were distributed to the most successful golfers. Low gross winners were Al Esko and Jim Ferguson, Plaskon Division, Libbey-Owens-Ford Glass Co. The committee in charge of arrangements was headed by Morrie Meltzer, Service Plastics Co., and included Harry Hill, Celanese Corp. of America, and Gordon Labounty, Louis Fishman & Co. The other golf outings will be held on July 24 at Rolling Green Country Club, and on August 17 at River Forest Country Club.

Visit Dayton Rubber Plant

The Miami Valley Section held its last regular meeting of the season on May 17, with 35 members and guests attending. The meeting began with a dinner at Neil's Restaurant, Dayton, O. Instead of the usual technical session following the dinner, the group toured the plant of the Dayton Rubber Co. and witnessed the manufacturing operations on tires, belting, and other rubber products. Refreshments were served through the courtesy of Dayton Rubber. The meeting concluded with a drawing for three door prizes, consisting of foam rubber pillows, contributed by the company.

National Plastics Exhibit

THE Fifth National Plastics Exposition, sponsored by the Society of the Plastics Industry, Inc., will be held March 11-14, 1952, at Convention Hall in Philadelphia, Pa. According to P. Harry Grunnagle, Westinghouse Electric Corp. and chairman of the SPI exposition committee, Philadelphia was chosen because of its geographical location, because Convention Hall does not have a floor load restriction, and because the space available for the show will permit all exhibitors to be on one floor.

Other members of the exposition committee in addition to Mr. Grunnagle are: Henry E. Griffith, Plax Corp.; J. F. Nicholl, Lumite Division, Chicopee Mfg. Corp.; S. J. Helsper, Mack Molding Co.; F. S. Strauss, Harte & Co., Inc., M. C. Bailey, Koppers Co., Inc.; D. C. Guthrie, Tennessee Eastman Division, Eastman Kodak Co.; Russ Matthews, Bakelite Division, Union Carbide & Carbon Corp.; H. S. Spencer, Durez Plastics & Chemicals, Inc.; A. T. Wolcott, General Electric Co.; Corliss Cummins, Dow Chemical Co.; Jack Gillespie, Watson-Stillman Co.; J. R. Turnbull, Monsanto Chemical Co.; William T. Cruse, SPI executive vice president; M. A. Brown, Plaskon Division, Libbey-Owens-Ford Glass Co.; and Ralph Teetsel, E. I. du Pont de Nemours & Co., Inc.

(*Continued on page 460*)

Scientific and Technical Activities

Rubber Division, C. I. C., Holds Meeting in Kitchener

THE Regional Conference of the Rubber Chemistry Division of the Chemical Institute of Canada, held in Kitchener, Ont., Canada, June 15, was one of the most successful meetings the Division has ever had. Attendance at the one-day technical session and at the banquet that evening was about 175 members and guests.

A feature of the meeting was a talk by William O'Neil, president of The General Tire & Rubber Co., Akron, O. Mr. O'Neil was introduced by J. R. Nicholson, until recently executive vice president of the Canadian Government's synthetic rubber producing company, Polymer Corp., Ltd.

The Technical Sessions

J. T. Black, Polymer Corp., chairman of the Division, opened the technical sessions with a welcome to the members and guests present and introduced Gaston Fournier, Acton Rubber Co., Actonvale P.Q., who presented the first paper on **"Quality Control at No Cost for the Rubber Industry."**

In this paper an attempt was made to define quality control and to demonstrate that applications of quality control do not have to be complicated and costly to be effective. It was shown how simple control charts are used to segregate important information from the huge quantity of data that appear on most production control reports. A description of a "Digest Report," which is prepared for management and which summarizes all the reports on quality and scrap into one simple report, was given. Two typical production control reports, "The Daily Damage and Defective Report" and the "Calender Running Book" were analyzed to show the part played by the control chart in the preparation of the "Digest Report," and some outstanding results obtained by the use of control charts were also described.

Since all the applications explained in this paper involve only a change in the method of presentation of data which requires no more clerical work than older methods, it was concluded that quality control principles can be applied at no appreciable increase in cost to the rubber industry.

The second paper, **"Hard Rubber,"** was given by E. D. Jackson, Joseph Stokes Rubber Co., Welland, Ont. Natural rubber, GR-S, and nitrile type rubbers and the products obtained by reclaiming the soft vulcanizates of these rubbers may be vulcanized with fairly large amounts of sulfur (25-47%) to produce hard rigid materials. Hard rubber articles may be produced in a number of ways, by machining from sheets, rods, or tubes, by building on a metal form and vulcanizing in open steam and by molding.

Natural rubber was indicated as being more suitable for the manufacture of built-up hard rubber products; while GR-S was stated to be better for molded products. Nitrile type rubbers provide products with greater resistance to heat softening, and reclaimed rubber is useful in reducing costs where the characteristics required in the product will permit its use.

High styrene resins can be used in the manufacture of hard rubber products to produce articles with high impact and tensile strengths with high elongation, but the greater thermoplasticity of these resins is a disadvantage, Mr. Jackson explained.

"A Mid-Century Review of Rubber Carbons," by H. A. Braendle, Columbian Carbon Co., New York, N. Y., was the third paper on the program.

The black tire tread recently celebrated its fortieth birthday, it was pointed out. For 30 years the virtues of its two principal components: namely, natural rubber and carbon black, were exploited without a satisfactory understanding of why or how each contributed its share to tire performance or why these two formed such a unique union. During the last decade through the discovery of the electron microscope, the expansion of the synthetic rubber industry from pilot to full scale and the development of a new family of carbons by new processes, rubber and carbon black technology has moved from the qualitative to the quantitative. The "Three Building Stones of Carbon Quality (Surface, pH, and Structure)" represented the first rationalization of empirical knowledge of carbon black, Mr. Braendle said. Since then new anomalies in carbon black behavior have appeared. Three of these were discussed:

(1) Roughness factors, i.e., the ratio of surface determined by adsorption methods and by direct measurement.

(2) Unsaturation factor, defined as the ratio of iodine adsorption to nitrogen adsorption. P-33 and Graphon both are low modulus blacks; yet one has high, and the other no unsaturation. Graphon, EPC and SRF carbons have no unsaturation, yet differ widely in modulus development. Unsaturation does not thus seem to be a sufficient explanation for the rubber to carbon bond.

(3) Gel forming tendencies of carbon of identical morphology and pH may differ widely. Physical adsorption does not appear to be the whole answer to bound or insolubilized rubber.

To explain the carbon effect (on rubber), the carbon gel approach seems promising. The anomaly of gel promotion and gel repression by carbon black, as temperature of treatment is changed, has been rationalized. Carbon black acting as an antioxidant for rubber adsorbs the oxidative intermediate which produces scission at low temperature (i.e., below 135° C.) and produces polymer gel at higher temperatures. In so doing, it binds or insolubilizes the rubber into carbon gel.

"White Carbon Black—What Is It?" was the title of the fourth paper, by V. H. Vodra, Wyandotte Chemical Co., Wyandotte, Mich.

A progress report in the search for the "white carbon black" was made. The properties of various carbon blacks were discussed and compared with those of many non-black fillers. Evidence was offered that far greater differences exist between the extremes of one group of non-black fillers than exist between the extremes of all rubber carbon blacks. Thus, merely evaluating one member will not establish the entire values for the group as a whole.

Electron photomicrographs of 28 common rubber fillers were offered to illustrate similarity and differences in particle shapes and sizes. The effect of particle size on quality was shown for both natural and GR-S rubbers.

Practical compounding suggestions and demonstrations were offered to take advantage of the best qualities of some non-black fillers to improve properties and lower costs over those possible with regular carbon blacks.

"The Frosting of Vulcanized Rubber" was the fifth paper on the program and the first for the afternoon session. This paper was given by J. T. Beaudry, Dominion Rubber Co., Ltd., Montreal, P.Q.

A definition of "frosting," as a bloom coming to the surface of certain vulcanized rubber products and differing from other types of bloom in that it is quite insoluble in ordinary organic solvents and most of the heavy inorganic acids, was given.

The occurrence of frosting was shown to be associated with the absorption of ozone and oxygen by unvulcanized rubber from the air, mostly during the breakdown process previous to mixing of the rubber compound. Ordinary compounding ingredients were tabulated into groups of those enhancing, inhibiting or being inert to the development of frosting.

Means of preventing frosting were discussed, and the probable composition of the frosting material was suggested.

"Mechanical Rubber Goods with Special Emphasis on Latest Design and Testing Methods for Automotive Parts," by F. L. Haushalter, Firestone Industrial Products Co., Detroit, Mich., was the next paper on the program.

A general definition of mechanical rubber goods for automotive applications was first given as parts required for vehicles powered by internal combustion engines, both commercial and military.

In discussing the correlation between requirements of physical specifications and the fatigue life of specific parts, it was mentioned that the U. S. Army Ordnance now requires parts capable of service at −65° F. The present trend is toward narrowing specification limits for automotive rubber products, and an example of the recently revised specifications for Ford motor mounts was mentioned in this connection. "Doughnut"-type tank tracks were shown, and it was stated that natural rubber was at present used although blends with synthetic rubbers were being tried out. Improvements in rubber to metal adhesion since World War II were also covered in connection with the manufacture of these tank tracks.

The possibility that there would soon be a dynamic modulus specification for motor mounts was considered good. Testing machines for determining this property, as recently investigated by ASTM and SAE, were mentioned.

Curved radiator hose requiring resistance to flexing, higher temperatures, and internal pressures of 14 p.s.i. are now being demanded. A neoprene inner core must be used if the cooling medium is likely to contain oil, it was said.

Fan belts of ⅜-inch width made with neoprene and rayon cord are meeting most specifications, and GR-S is under test for this use in some cases. The degree of slip and retention of tension under 100-pound load for 10,000 miles are properties necessary in this product.



Speaker's Table at Rubber Division, C.I.C., Banquet, (*Left to Right*): W. Cline, Canadian General Tower, Chairman, Wellington-Waterloo Section, C.I.C.; George Stevens, Division Secretary-Treasurer; T. L. Davies, Division Vice Chairman; John Ramsay, Past Chairman, Rubber Division; J. R. Nicholson; William O'Neill; J. T. Black, Retiring Division Chairman; I. G. Needles; A. W. Hopton; N. W. Smith, Incoming Division Chairman; Eric Bolton, Division Executive Committee; and H. Schmaltz, Chairman, Ontario Rubber Section, C.I.C.

The need of ozone resistance in compounds used for windshield seals and proper rebound characteristics for axles bumpers were also mentioned.

Rubber torsion springs can be designed to give any required degree of deflection, the speaker said. Temperature in service might introduce the problem of crystallization, and close control of compound and the design of these springs would be required if greater use of this product developed.

"Tires—Rubber in Service," by M. G. Morgan, B. F. Goodrich Co. of Canada, Ltd., Kitchener, was the seventh paper on the program.

The stresses developed within a tire in service are quite complex, but are capable of measurement both by mathematical treatment and actual physical tests. The trend in the automotive industry toward smaller diameter and wider rims on passenger cars is in the direction of increasing the internal stresses on the tire and has resulted in some changes in tire design, it was said. This trend has also resulted in increasing the importance of proper tire maintenance if the maximum service is to be obtained.

It is the air in the tire that carries the load, and no tire can give satisfactory service unless it is the correct size and type, and correct air pressure is maintained. Too much air will result in rapid tread wear and increased tendency toward bruises, and in this connection the chart of service expectancy of a tire operating with underinflation and with overinflation, as prepared by The Rubber Manufacturers Association, Inc., New York, were exhibited.

Many other factors influence tire service, some of which are: heat, speed, road surfaces, drivers' habits, topography of the country, balance, cuts and mechanical troubles. Other RMA charts on the effect of road surface on tread wear and of speed on tread wear were also shown.

The tire industry has made great strides toward increasing the service life of its product, and with proper maintenance the tire user today can look forward to many more miles of trouble-free service than he could in the past, this speaker said in conclusion.

"The Production and Utilization of Plasticized High Mooney Viscosity Synthetic Rubber," by H. D. Harrington and K. V. Weinstock, General Tire, and N. R. Legge and E. B. Storey, Polymer Corp., was the final paper presented on the program.

Since the first part of this paper is presented in this issue of India RUBBER WORLD, and our June issue included an earlier paper by Swart, Pfau, and Leinstock, of General Tire, on plasticized high Mooney viscosity synthetic rubber, it is not necessary to review the paper in any detail here. Some interesting comparisons were given to show that in comparison with standard synthetic rubber, the relative rubber cost of tires made from this plasticized high Mooney viscosity synthetic rubber ranged from 82 to 54, with the figure for standard synthetic rubber set at 100.

The Business Meeting

At the business meeting of the Rubber Chemistry Division the following new officers were elected for the period until June, 1952: chairman N. W. Smith, Dominion Rubber; vice chairman, T. L. Davies, Polymer Corp.; secretary-treasurer, George Stevens, Goodyear Tire & Rubber Co. of Canada, Ltd. Three new members elected to the executive committee are: Eric Bolton, Goodrich of Canada; C. L. Brittain, Gutta Percha & Rubber, Ltd.; and H. Hencher, H. L. Blachford, Ltd.

The Division Banquet

Seated at the speakers' table at the Division banquet and in addition to Messrs. O'Neil and Nicholson mentioned previously were the new officers of the Division, the most recent past chairman, John Ramsay, Miner Rubber Co., Ltd.; officers of some of the local sections of the C.I.C.; I. G. Needles, vice president, Goodrich of Canada; and A. W. Hopton, vice president, Dominion Rubber. Mr. Black presided.

In introducing Mr. O'Neil, reference was made by Mr. Nicholson to the paper given at the afternoon session on high Mooney viscosity plasticized synthetic rubber and tribute was paid to General Tire and its workers in connection with this development. Mr. Nicholson mentioned the several foreign plants of General Tire and two new ones contemplated, one in Canada and one in Brazil.

Mr. O'Neil, in his talk, also paid tribute to Mr. Nicholson and Polymer Corp. and the continued interest in Canada in the free enterprise system of doing business. He referred to the reasons why General Tire did not enter into the United States Government's synthetic rubber patent pool and then mentioned briefly his difficulties in trying to negotiate an agreement for the commercial development of high Mooney viscosity plasticized synthetic rubber in the United States.

The speaker said that he felt synthetic rubber would not seriously interfere with the continued large-volume use of natural rubber, but that the advent of synthetic rubber would mean a greater use of both types.

Mr. O'Neil expressed great confidence in the future of the rubber industry and indicated that he felt its present rate of growth would continue for some time to come. As evidence of the dynamic nature of the industry, he pointed out that Akron had the second biggest group of chemists and engineers in the United States, most of which were employed by the several rubber companies located there. He added that cooperation in these companies at all levels between educated and non-educated employes was another reason for vigorous company growth taking place in the rubber industry.

Discuss Rubber Mountings

A TALK on rubber mountings by Ross E. Morris, Mare Island Rubber Laboratory, highlighted the May 31 meeting of the Northern California Rubber Group. Approximately 39 members and guests attended the meeting, held at the Berkeley Elks Club.

Mr. Morris's talk concerned the vibration of rubber motor mountings and was limited to a discussion of vertical vibration. The problem is to have a mount that is not in resonance with the motion. To have a dampening action by either a rubber mount or an iron spring, the motion must be more than the square root of two times the natural frequency of the mount. The natural frequency of a gum natural rubber stock approaches that of an iron spring, but the rubber is superior to the metal mount because of its lighter weight, resistance to corrosion and rust, and quieter action at high frequencies.

As the loading of fillers in the rubber is increased, hysteresis is increased, and the mount deviates from the frequency formula for a steel spring. In designing rubber mounts, therefore, it is advisable to allow 10-20% for hysteresis. Pure gum natural rubber is best for vibration motor mountings and is followed by the neoprenes, particularly Type W. The problem of shock absorption differs from vibration in that a stock with high hysteresis is required, and a Hycar OR-15 stock with channel black gives good results. To obtain highest efficiency from a given volume of rubber used as a mounting, it is usually best to put the rubber in shear if possible.

A reed-type instrument for determining vibration frequency, and a test fixture for determining deflection of mountings under various loads were demonstrated by Robert James, also of Mare Island. The discussion concluded with a showing of slides on the use of rubber mounts for dampening sound.

Rubber & Plastics Division, ASME, Toronto Meeting

THE Rubber & Plastics Division of the American Society of Mechanical Engineers held a one-day meeting in Toronto, Ont., Canada, on June 14, as part of the semi-annual meeting of the parent Society. Division activities consisted of two technical sessions, one on rubber and one on plastics, and a luncheon meeting of the executive and the general committees.

The Technical Sessions

W. Newlin Keen, E. I. du Pont de Nemours & Co., Inc., chairman of the Division, first introduced the chairman and vice chairman respectively, for the first session on rubber as Norman A. Grace, Dunlop Tire & Rubber Goods Co., Ltd., and J. I. G. Bell, Canadian Industries, Ltd., both of Toronto.

Dr. Grace then introduced the first speaker, P. C. Servais, Dow Corning Corp., Midland, Mich., who discussed "The Engineering Properties of Silicone Rubber." Mr. Servais reminded his audience that Silastic is the name coined to describe Dow Corning silicone rubber, usually a dimethyl silicone, compounded with inorganic reinforcing fillers such as silicon dioxide, titanium dioxide, zinc and ferric oxides. The relatively low tensile strength of Silastic is being overcome, in part, by new formulations such as Silastic 250, which has more than twice the mechanical strength of the earlier silicone rubbers. Data on hardness, compression set, thermal stability, aging dielectric properties, and thermal conductivity were presented to emphasize the point that Silastic is normally used to do a job no other rubber-like material can do, rather than to replace natural or synthetic rubbers where those materials give satisfactory service. Examples of numerous applications in aircraft, for gasketing, for roll covering, as a dielectric with or without glass cloth reinforcement, etc., were described to point out the special advantages of the silicone rubbers.

The second paper on the morning program was "Synthetic Elastomers for Use at Low Temperatures" by S. C. Einhorn and N. R. Legge, Polymer Corp., Ltd., Sarnia, Ont. This paper described the physical properties and low temperature flexibility of polymers prepared at 140, 86, 59, and 41° F. with charge ratios of 100/0, 95/5, 90/10, 85/15, 80/20, and 75/25 butadiene/styrene. Based on the data presented, the 90/10 butadiene/styrene copolymer polymerized at 41° F. was chosen for low-temperature service applications.

The crystallization of polybutadiene prepared at the above temperatures and at 14° F. was studied by means of loss in Gehman low-temperature flexibility and by the TR retraction test.

The effect of swelling on the low-temperature flexibility of butadiene/acrylonitrile copolymers was also mentioned.

The third and final paper on the morning program was on "Neoprene Applications in Engineering Design," by R. W. Malcolmson, du Pont. Mr. Malcolmson pointed out that in the 20 years since neoprene was first introduced commercially, it has gained widespread acceptance in a large variety of products. The fact that literally thousands of neoprene compounds are available makes it difficult to know what properties are basic and specific for neoprene, it was said.

The paper reviewed the principal properties of neoprene compositions and described some of their engineering applications. Emphasis was placed on properties which are little understood or which are significantly different from those of other elastomers—those include compression set, dynamic properties, creep, low-temperature behavior, and resistance to oils, solvents, chemicals, sunlight and weathering, oxidation (aging), ozone, and heat.

Some of the major uses and some of the more unique applications for neoprene were covered briefly.

The afternoon session on plastics had as chairman J. B. Farrell, Farrell Plastics, Ltd., and as vice chairman, R. M. Ferguson, R. M. Ferguson & Co., both of Toronto.

The first paper, "Electrical Control of Air Flow Porosity in Plastic Sheet Materials," by Jerome J. Suran, John W. Meaker & Co., New York, N. Y., dealt with a process known as "electro-venting," that is passing of electric sparks through sheet materials for the purpose of creating holes. The process, which first arose in connection with the paper bag-making industry, controls the character, quantity and number of holes by control of the current and voltage between two plate electrodes between which the sheet material is passed.

Development of the process for plastics is still in the early stages, but possible applications include increasing the amount of air flow in plastic film used for food packaging, in film used for hats, shoes, and other articles of wearing apparel.

The second paper was entitled "Effect of Orientation on the Mechanical Properties of Polystyrene," by Albert G. H. Dietz and Robert G. Cheatham, Massachusetts Institute of Technology, Cambridge, Mass.

Extruded rods of polystyrene were annealed in an oil bath, and the mechanical properties—tension, torsion, flexure, compression—determined at various rates of load application and various rates of straining and deflection. Creep and relaxation measurements were also made.

By annealing and stretching the polystyrene so that the molecules would lie more parallel, the stretched pieces, after cooling, showed ultimate strengths in the direction of stretch orientation approximately threefold those of the unstretched pieces. In highly stretched samples the tendency to craze disappeared. Under load sufficient to produce ultimate fracture the oriented polystyrene exhibited much increased stretch (ductility) and behaved like steel or copper.

Various ideas were tried for the measurement of the degree of orientation. Low-angle X-ray diffraction pattern and birefringence of visible light showed that only a low order or orientation results from the stretching. No development or crystalline areas, as in metals, was found in polystyrene so prepared.

The final paper on the program was "The Effect of Absorbed Water on the Physical Properties of Phenolic Plastics" by H. M. Quackenbos, Jr., Bakelite Division, Union Carbide & Carbon Corp., New York, and J. M. Hill, Harvard University, Cambridge.

Mr. Quackenbos criticized the ASTM method for the determination of water absorption of phenolic plastics as too limited and liable to give results not borne out by service uses. He said that the absorption of water by phenolic plastics obeys Fick's law and can be described completely by a saturation constant, a diffusion constant, and a simple relation between diffusion constant and temperature. Data may be calculated for various grades and for applications where different thicknesses are used.

Two important consequences of water absorption are that mechanical properties change and all dimensions expand. Several effects of water absorption on phenolic plastic articles were described, and the means of reducing detrimental effects to a minimum by proper compounding and engineering design of parts was explained.

Committee Meeting

At the meeting of the executive and the general committees presided over by Mr. Keen, decisions regarding publication of papers given before the Division were made, and plans for future meetings discussed.

The Division expects to meet with the parent Society in Atlantic City, N. J., in December, 1951, in Chicago, Ill., in September, 1952; and in New York in December, 1952.

Chemistry Congress to Meet

THE International Congress of Pure and Applied Chemistry will hold meetings in New York, N. Y., September 10 through 13, following the one hundred and twentieth meeting of the American Chemical Society. The International Congress meets every four years in the same country in which there is a meeting of the Conference of the International Union of Pure and Applied Chemistry. Under the auspices of the union, the Congress is organized and run by the adhering body to the union in the host country—this year by the National Research Council of the United States of America.

The meetings of the Congress are open to all persons who are interested in the advancement of pure chemistry and its applications to industrial and practical life and who sign the application form for membership and pay a fee of $7.50. (The fee for combined enrollment in both A. C. S. and the Congress is $13.)

The 16 sections of the Congress cover all areas of modern chemistry. The chairman of the section on elastomers and plastomers for the New York meeting is R. P. Dinsmore, vice president in charge of research and development, Goodyear Tire & Rubber Co. Vice chairman is N. E. Van Stone, vice president, Sherwin-Williams Co., and secretary is P. O. Powers, technical adviser, Battelle Memorial Institute. The scope of the activities of this section includes natural and synthetic fibers, resins, rubbers, textiles, drying oils, paint, varnish, coatings, glass, and ceramics.

The section on macromolecules has as its scope structure, theory of polymerization, and silicone polymers. The officers of this section are: chairman, Herman Mark, Polytechinc Institute of Brooklyn; vice chairman, Emil Ott, Hercules Powder Co., Inc.; and secretary, Paul M. Doty, Harvard University.

Information on the Congress may be obtained from Harry L. Fisher, administrative assistant, National Research Council, 2101 Constitution Ave., Washington 25 D. C.

Chemical Market Research Association Meeting on Rubber

THE Chemical Market Research Association held a one-day meeting at the Roosevelt Hotel, New York, N. Y., June 7. The theme of this meeting was "Rubber and Rubber Chemicals." At the afternoon session Frank K. Schoenfeld, technical vice president, B. F. Goodrich Chemical Co., acted as moderator and introduced H. R. Thies, manager, chemical division, Goodyear Tire & Rubber Co., who spoke on "Commercial Synthetic Rubbers"; B. S. Garvey, Jr., director, sales service laboratory, Sharples Chemicals, Inc., who discussed "Process Chemicals"; and W. F. Tuley, technical director, reclaim and Paracril, Naugatuck Chemical Division, United States Rubber Co., who dealt with "Synthetic Rubbers—Specialized Types and Applications." G. A. Kirton, Celanese Corp., was chairman of the program committee for this meeting.

At the dinner, presided over by the newly elected president of the Association, E. K. Burger, Esso Standard Oil Co., Inc., the speaker was Everett G. Holt, special assistant to the director, Rubber Division, National Production Authority. Mr. Holt, who spoke on "Rubber Materials and the Rubber Industry," was introduced by Norman A. Shepard, chemical director, American Cyanamid Co.

The Afternoon Session

Dr. Schoenfeld, in his introductory remarks, commented on the $3-billion sales volume of the rubber goods industry as evidence of its consumption of both rubber and rubber chemicals. He pointed out, however, that the rubber industry was under such complete government control that its hope for future progress lay in its efforts in research, development, and commercialization of new products.

Mr. Thies emphasized that the period 1940-1950 has seen the development of very exciting, worthwhile commercial usages for a number of synthetic rubbers and latices and that in his opinion these developments are just getting under way. In discussing the problems involved in marketing butyl rubber for inner tubes, it was mentioned that perfection of the butt splicing of inner tubes using butyl rubber required $100,000 and approximately 50 men working for eight weeks in a tube manufacturing plant to determine the necessary variations in manufacturing procedure required with butyl tube stock. Polymerization methods and formula for nitrile and GR-S type rubbers were described, and the present areas of natural and GR-S competition for use in various rubber products explained.

A very fast race is going on at present among the latices of neoprene, butadiene-acrylonitrile, and butadiene-styrene types of rubbers, seeking to find, develop, and hold a very major market position. Synthetic latices are used for such a wide variety of purposes and handle so nicely that one cannot help but feel that the future holds a great deal of promise for these materials. For example, the uses consist of not only the older commercial practices, such as dipping with forms and making adhesives, but newer practices such as paper impregnation and coating, leather finishing, manufacture of non-woven fabric, and the utilization of latex as a vehicle for paints, Mr. Thies said.

Dr. Garvey, in discussing "Rubber Processing Chemicals," used the ingredients in a typical tire-tread recipe to enumerate the major basic chemicals utilized in rubber compounding and processing and then went on to show the amounts used based on rubber consumption for various years, such as 1948, 1949, and 1950. Using 2.5 p.h.r. of sulfur as an average for rubber vulcanization, he estimated that 38,000 long tons of sulfur were used by the rubber industry in 1950. Of the other vulcanizing agents, GMF, *p*, quinone dioxime; Dibenzo GMF, *p, p'*, dibenzoyl quinone dioxime; sulfur monochloride, selenium, etc., he pointed out that if 2% of the butyl rubber used in 1950 were vulcanized with 2 p.h.r. of GMF, it would require about 30,000 pounds of this material.

The average amount of accelerator used is probably between 1.0 and 1.5 p.h.r., and the following figures were presented to show that for 1948 and 1949 rubber consumption, 1.0 p.h.r. is very close to the Tariff Commission figure for pounds sold, and the 1.5 p.h.r. figure is very close to that for pounds produced.

ACCELERATOR CONSUMPTION

Millions of Pounds	1948	1949
1.0 p.h.r. on total rubber used ..	29.7	27.0
Total accelerator sales*	29.6	27.3
1.5 p.h.r. on total rubber used ..	44.6	40.6
Total accelerator production*...	46.8	41.3

*U. S. Tariff Commission.

Dr. Garvey then gave figures for accelerators produced in 1948, in millions of pounds, as follows: aldehyde amines, 1.6; thiocarbamates, 1.2; thiuram sulfides, 3.2; guanidines, 5.2; and thiazoles, 35.6. The total production was 46.8 millions of pounds.

The thiazoles, which make up about three-quarters of the total accelerators produced, are of the following types and amounts for 1948, in millions of pounds: mercaptobenzothiazole, 12.2; benzothiazyl disulfide, 9.8; benzothiazyl sulfenamide, 9.0; formaldehyde aniline plus MBT, 2.0; zinc salt of MBT, 2.0; miscellaneous, 0.6.

Stearic acid, or some fatty acid as used to activate acceleration, aid pigment dispersion, and lubricate the batch to the extent of about 1.5 p.h.r. in 1950 amounted to about 23,000 long tons.

Assuming 1.0 p.h.r. of antioxidant used in all rubber compounds and the 1.25 p.h.r. used in the production of GR-S, Dr. Garvey estimated that 42.11 million of pounds were used in 1948 and 35.79 millions of pounds were used in 1949. These figures were higher than those given by the Tariff Commission, 39.39 and 32.97 millions of pounds, respectively, for the same two years. Heptylated diphenyl amine and substituted phenols were named best examples of non-discoloring antioxidants.

Softeners, which are principally oils and tars from petroleum, coal, and rosin, are used in a range of 3-5 p.h.r., and 1950 requirements were indicated as between 45,000 and 75,000 long tons.

Dr. Garvey then covered the many other chemicals used in processing rubber, but which were used in lesser amounts. He stressed the fact, however, that any ingredient used to the extent of 1.0 p.h.r. on 5,000 tons of rubber is used to the extent of 100,000 pounds, and that 5,000 tons of rubber was only 0.3% of the total used in 1950.

Under miscellaneous materials were discussed antiseptics, blowing agents for sponge rubber, odorants, and peptizing agents. Next mentioned were some of the chemicals used with latex, such as dispersing and wetting agents, gelling agents, preservatives, etc.

Raw material requirements for rubber chemicals were also covered. Aniline requirements for accelerator and antioxidant production in millions of pounds, based on 1948 rubber consumption, were given as 21.5 for thiazoles, 3.0 for guanidines, 1.6 for aldehyde amines, and 20.0 for antioxidants. Requirements, again for 1948 and in millions of pounds, for carbon disulfide for thiocarbamates were given as 0.8, for thiurams as 2.0, and for thiazoles as 14.2. In addition to these materials, there were required around 2 million pounds of secondary aliphatic amines, 5 to 10 million pounds of beta naphthol and substantial quantities of oxidizing agents such as chlorine and sodium nitrite.

The more spectacular developments in the rubber industry in recent years have been in the development of new polymers and improved carbon blacks rather than in the field of process chemicals. Of the newer developments in process chemicals, non-staining, non-discoloring age resistors have approached, if not equalled, the antioxidant activity of the standard materials. In the accelerator field, the effort is to get better delayed action without sacrifice of cure time, and Ethylac is a step in the right direction here, it was said. In some respects the vulcanizing agents, such as thiurams, the alkyl phenol sulfides, and the thioamines are better than sulfur, and efforts are continuing to develop the use of these materials further and to make their use more economical.

Finally and of equal importance, Dr. Garvey said, were the increasing knowledge and understanding of how to use materials which are available. A little improvement here and a little there can result in substantial advances, he added.

Dr. Tuley, in his talk on specialized types of synthetic rubbers, said that the special grades of synthetic rubber constitute a group of chemical products for the rubber industry presently experiencing the greatest technological development. Important characteristics now available in rubber and rubber-like products through use of special synthetic rubbers are: (1) flame resistance; (2) improved weather resistance; (3) performance at extreme low and high temperatures; (4) high impact resistance in rigid and semi-rigid forms, even at low temperatures; (5) much improved resistance to oil, solvents, and reactive chemicals; (6) controlled variations in flexibility and hardness; (7) permanent rather than migratory plasticizer content for polyvinyl chloride compounds; (8) low permeability to gases; (9) superior electrical resistance.

"Thiokols," including the new liquid polymers, were discussed with reference to their use for articles formed by casting, for impregnation and surface coatings.

Under neoprene, the recent development of an air-curing protective neoprene paint was mentioned.

Under special types of general-purpose rubbers were mentioned cross-linked GR-S, arctic polymers, synthetic latices, and silicone rubbers.

"Hypalon," made from polyethylene by chlorination and sulfonation, is a vulcanizable polymer made available in experimental quantities by the du Pont company during the last year. Physical properties of non-carbon black compounds of "Hypalon" are superior to those obtained with most other

synthetic rubbers with carbon black. This new synthetic has exceptional resistance to heat, ozone, and weathering, it was said.

It is necessary to appreciate the increased complexity of rubber technology resulting from the introduction of the number of new types of synthetic elastomers, each of which may be produced in from a few to many varieties. The rubber technologist must now know how to utilize these many synthetics, how to fabricate them into usable commercial articles, and know their performance characteristics to insure satisfactory service.

Finally, the raw materials for these synthetic rubbers require many supplementary chemicals in addition to the hydrocarbons derived from petroleum and coal. The impact of these requirements for acids, alkalies, emulsifiers and wetting agents, catalysts, and various agents for short-stopping the polymerization and stabilizing the polymers, during the past ten years has been tremendous. The future volume and usage of these synthetic elastomers and their consequent raw material requirements are a complex problem of market analysis and forecasting, Dr. Tuley said in conclusion.

The Dinner Meeting

Mr. Holt said in his talk that the rubber industry probably has more experience with government controls than any other industry. He reviewed national and international controls on rubber and emphasized that the present aim of the United States Government with regard to rubber is the provision of ample finished rubber products for use by the American public at reasonable prices.

In discussing present-day controls, Mr. Holt declared that after 1947 we reduced the required use of synthetic rubber and permitted increased use of natural rubber, even in 1949 and early 1950 while world stocks of rubber were declining, to an extent we now know was unwise and contributed to the rubber shortage and the fantastically high prices we have since experienced, but which now, barring untoward events, seem to be nearing their end. By stockpiling natural rubber, by requiring the use of synthetic only to the tonnage necessary for national security, and by producing only enough synthetic to meet demand, the United States, however, has prevented any burdensome surplus of rubber since World War II.

The primary object of activities of the National Production Authority is, first, to see that military orders are supplied promptly and, second, to maintain the civilian economy with remaining materials equitably distributed among manufacturing companies. If more natural rubber were authorized to make sure civilian demand for rubber products were completely satisfied, the rate of progress toward achievement of our stockpile goal of natural rubber would be correspondingly slowed, so that any such immediate prospect is unlikely, Mr. Holt stated.

When events will permit us to move toward reduction or abandonment of controls and of preparatory mobilization is a question of national security. It is also a subject of active discussion and some difference of opinion, it was said. Complete cessation of controls in 1951 is not expected. On the other hand, he was glad to be able to assure his audience that among his associates in NPA he finds no attitude favoring control for the sake of control, and there is general hope that controls can be abated in the not too distant future, Mr. Holt concluded.

Weather Mars Outings

FOR the second year in succession unfavorable weather limited both the attendance and activities at the New York Rubber Group's annual outing on June 14 at Doerr's Grove, Millburn, N. J. Approximately 140 members and guests were present and, despite the weather, competed in the boccie, darts, buck horseshoe, basketball throw, and ping-pong contests. For the less hardy, card playing and other more sheltered activities were available, but all present partook of the refreshments served all afternoon and the chicken dinner concluding the outing.

Following the dinner, prizes were awarded to the following contest winners: boccie, M. R. Buffington and Harry G. Eckhardt, both of Lea Fabrics, Inc.; darts, Michael Masters and Gordon Voigt, both of Niagara Rubber Co.; buck horseshoes, Frank Pace, Lea Fabrics, and W. F. Lamela, Okonite Co.; basketball throw, M. J. Hall, Baker Castor Oil Co., and Mr. Masters; and ping-pong, F. J. Millo and Stanley Rutkowski, Sindar Corp. Because the usual softball and other contests could not be held, the remaining prizes were distributed by lot and were won by Jack Phelps, Rodic Rubber Corp.; F. C. Nicholas, Textile Proofers, Inc.; Mr. Masters; R. B. Carroll, R. E. Carroll, Inc.; and Arthur Bald, Pittsburgh Plate Glass Co. Arrangements for the outing were under the chairmanship of George N. Vacca, Bell Telephone Laboratories, Inc.

Boston Group Outing

An all-day rain failed to dampen the the enthusiasm of 475 members and guests of the Boston Rubber Group who attended the fifteenth annual summer outing on June 15 at United Shoe Country Club, Beverley, Mass. The inclement weather prevented the running off of some of the scheduled activities, but active participation was shown in the golf, bowling, darts, and indoor horse racing contests. A lobster dinner was served in the evening, followed by the distribution of door prizes donated by 177 rubber and supplier companies, and prizes to winning contestants.

Nineteen awards were made in the golf tournament, with first prize winners as follows: kickers handicap, Frank Post, Frank Post Co.; low gross, Charles Hamilton, Raffey & Swanson Co.; low net, E. G. Swanson; nearest to pin, R. E. Nippes, Columbia Chemical Division, Pittsburgh Plate Glass Co.; high gross, E. H. Garrison, Monsanto Chemical Co.; and high net, C. E. Roder, Compo Chemical Co. Bowling awards were given to Charles Wilson, Sun Oil Co.; and Albert M. Brown, Stedfast Rubber Co. Prizes in the darts contest went to C. M. Grafton, E. Collins, and R. Gerade, all of Goodall-Sanford, Inc.; P. Bratenas, Hood Rubber Co.; and James Lang, Bakelite Corp. A full set of golf clubs raffled off by the club pro went to Paul Keohan, Avon Sole Co.

Arrangements for the outing were handled by a committee headed by W. F. Malcolm, Titanium Pigments Corp., and including J. A. Williams, Haartz-Mason Co., and Harry Atwater, Hood Rubber. Lyle Longworth, Monsanto, was in charge of the golf tournament; while the darts, bowling, and horse racing contests were handled by N. W. Herthel, Hood Rubber, J. E. Williamson, Tyer Rubber Co., and Carl Meyer, Harwick Standard Chemical Co., respectively.

Record Throng at Akron Outing

A record attendance of 704 members and guests participated in the annual summer outing of the Akron Rubber Group, held on June 15 at Firestone Country Club. A golf tournament featured the outing and attracted so many players that only 247 were able to play on the Club course while more than a hundred others were obliged to play on nearby courses. Other activities on the program were softball and horseshoe pitching, followed by a dinner in the evening and the distribution of prizes.

Low gross honors in the golf tournament were won by John Cseh, Firestone Tire & Rubber Co. Other golf prizes went to M. R. Batche; John R. England; Jack Graham; Larry Jacobson; A. E. Laurence, Phillips Chemical Co.; M. H. Leonard, Binney & Smith Co.; Allen Levin; H. B. McCreary; J. C. Richards, B. F. Goodrich Chemical Co.; John Rowe; J. J. Shomock, Pyramid Rubber Co.; and R. S. Taylor. More than 300 door prizes were also distributed in a drawing after dinner.

Ferde Bonstedt, Sid Richardson Carbon Co., was general chairman of the outing; William V. Sauter, E. I. du Pont de Nemours & Co., Inc., headed the prize committee; Mr. Leonard chairmanned the golf committee; and arrangements for food and location were handled by L. V. Cooper, Firestone.

Membership Chairman V. L. Petersen, Goodyear Tire & Rubber Co., announced that the Group now has a record-breaking total of 1,286 members.

New Blowing Agent

ANSUL BLO, a new sponge rubber blowing agent, has been introduced by Ansul Chemical Co., Marinette, Wis. A bicarbonate-type material, Ansul Blo has been chemically processed to resist water absorption and caking and to flow freely under the most adverse conditions of storage and handling. Its uniform particle size provides fast, even dispersion throughout the rubber, and the material produces a complete and even blow. Leaching is held to a minimum, and premature blow is eliminated with the new product, which is said to be non-toxic, odorless, and non-discoloring. Preliminary tests indicate that one part of Ansul Blo is equal to two parts of sodium bicarbonate, and that the material is suitable for use with GR-S and some neoprene sponge rubber compounds. Test samples of the new blowing agent may be obtained from the company.

EDF Crystals Available

THE availability of the crystalline condensation product of ethylene diamine and formaldehyde, commonly identified as EDF crystals, has been announced by Clopay Corp., Cincinnati, O. The compound available is in the form of white crystals having a melting point of 186-189° C. The product is extremely useful as a high-speed setting agent for phenolic-type resins and adhesives and should also be of interest for use with natural and synthetic rubbers.

Quebec Group Elects

L. C. MACLEOD, Monsanto (Canada), Ltd., has been elected chairman of the Quebec Rubber & Plastics Group for the coming year. Other directors of the Group are: R. G. Davies, Canadian Industries, Ltd.; William Edward, Delacour-Gorrie, Ltd.; G. Fournier, Acton Rubber Ltd.; R. Harrison, Canadian General Electric Co., Ltd.; A. S. Johnston, Northern Electric Co., Ltd.; H. A Kushnarov, Dominion Rubber Co., Ltd.; C. W. MacEachern, General Latex & Chemicals (Canada), Ltd.; A. G. Pinard, Canadian Resins & Chemicals, Ltd.; and M. Renshaw, British Rubber Co., Ltd.

The new officers and directors were announced at the Group's annual golf tournament, held June 8 at the Granby Golf Club, Granby, P. Q. Some 70 members and guests participated in the tournament; while 90 were present at the dinner concluding the affair. Low gross for the day was won by C. P. Dearth, Bolta Plastics, Ltd., and about 40 prizes were distributed to winning contestants. Arrangements for the tournament were ably handled by Mr. Davies and R. G. Rea, Monsanto.

International Symposium on Abrasion and Wear

THE Rubber-Stitching, Delft, Holland, reports that its previously announced International Symposium on Abrasion and Wear will take place November 14 and 15. The meeting, to be held on the occasion of the opening of the organization's new building, will include a program of speakers from Holland, England, and the United States, as well as exhibits of apparatus for measuring wear and abrasion.

Papers will be presented by the following: F. P. Bowden, Cambridge University, England; H Blok, Royal Dutch Shell Laboratory, England; J. J. Broeze, Royal Dutch Shell Laboratory, Holland; G. Salomon, Rubber-Stichting; J. M. Buist, Imperial Chemical Industries, Ltd., England; A. Schallamach, British Rubber Producers' Research Association, England; N. A. Brunt, Paint Institute, Holland; R. D. Stiehler, National Bureau of Standards, U.S.A; and H C. J. de Decker, Rubber-Stichting. Symposium papers and discussions will be printed in *Engineering* (London) and afterward in book form.

There will be no entrance fee for the symposium, and interested persons can obtain further information by writing to the secretary, H. C. J. de Decker, Rubber-Stichting, Postbox 66, Delft, Holland.

Soludiene Solvent

SOLUDIENE SOLVENT is now available in tank cars or drums, according to the manufacturer, Colonial Alloys Co., Philadelphia 29, Pa. Recommended as a solvent for rubber, various synthetic resins, waxes, and other materials, the solvent has an approximate composition of 65% paraffines, 20% naphthenes, and 15% aromatics. Average physical properties follow: weight per gallon, 6.27 pounds; ASTM boiling range, 280-320° F. (50% distilled at 290° F.); specific gravity, 0.753; flash point, 83° F.; and viscosity at 77° F., 0.86 centistokes. Test samples are available from the manufacturer.

More Resorcinol Coming

KOPPERS CO., INC., Pittsburgh, has begun an expansion program at its Petrolia, Pa., resorcinol plant which will increase annual production from 4,500,000 to 6,000,000 pounds. The NPA has granted Koppers a certificate of necessity for the expansion in view of the critical shortage of resorcinol for the preparedness program. The program includes improvements and additions to the plant, which will then employ a new production process developed by Koppers and said to make more efficient use of raw materials. Resorcinol is used in treating rayon tire cords to improve adhesion, in waterproof adhesives, and in high-quality dyestuff bases.

Koppers has also developed a new room-temperature setting adhesive that uses 40% less of scarce resorcinol, yet can pass stringent tests heretofore met only by straight resorcinol adhesives. Developed at the company's Petrolia, Pa., plant, the new adhesive, known as Koppers Penacolite G-1260, is available immediately to users who can qualify under government regulations. According to T. C. Keeling, assistant vice president of the chemical division, the new development comes at a particularly opportune time for the defense program, since the adhesive will satisfactorily meet most Army, Navy, and Air Corps demands.

CALENDAR

July	20.	Buffalo Rubber Group. Outing. Lancaster Country Club.
July	24.	Chicago Section, SPE; Midwest Chapter, SPI. Golf Outing. Rolling Green Country Club, Arlington Heights, Ill.
Aug.	3.	Chicago Rubber Group. Golf Outing.
Aug.	7.	New York Rubber Group. Golf Tournament. Baltusrol Golf Club, Springfield, N. J.
Aug.	17.	Chicago Section, SPE; Midwest Chapter, SPI. Golf Outing. River Forest Golf Club, Elmhurst, Ill.
Aug.	24.	Philadelphia Rubber Group. Annual Outing. Cedarbrook Country Club, Philadelphia, Pa.
Sept.	2-8.	American Chemical Society, New York, N. Y.
Sept.	5-7.	Division of Rubber Chemistry, A. C. S. Hotel Commodore, New York, N. Y.
Sept.	20.	Southern Ohio Rubber Group. Engineer's Club, Dayton, O.
Oct.	2.	The Los Angeles Rubber Group, Inc. Hotel Mayfair, Los Angeles, Calif.
Oct.	8-12.	National Hardware Show. Grand Central Palace, New York, N. Y. Thirty-Ninth National Safety Congress and Exposition. Chicago, Ill. Chicago Section, SPE; Midwest Chapter, SPI. Builder's Club, Chicago, Ill.
Oct.	10.	Newark Section, SPE. Military Park Hotel, Newark, N. J.
Oct.	17.	New York Section, SPE. Hotel Shelburne, New York, N. Y.
Oct.	19.	Akron Rubber Group. Boston Rubber Group.
Oct.	23.	Buffalo Rubber Group. Hotel Westbrook. Buffalo, N. Y.
Oct.	26.	New York Rubber Group. Henry Hudson Hotel, New York, N. Y.

New Vinyl Stabilizer

STABELAN G-1, a new stabilizer for vinyl chloride resins and copolymers, has been released by Stabelan Chemical Co., Toledo, O., for distribution through Harwick Standard Chemical Co., Akron, O. This new member of the Stabelan series is a completely homogeneous paste composed of 100% active components contributing to the heat and light stabilization of vinyls. The stabilizer is also recommended for use with vinyl organosols and plastisols.

Laboratory and plant tests have shown that the new paste imparts excellent heat stability and prevents discoloration of vinyl resins during fluxing or fusion at high temperatures (up to 340-350° F.). Laboratory tests have further revealed that Stabelan G-1 appreciably retards the breakdown of vinyls under prolonged heat aging. Outdoor tests in Florida on vinyl films have shown the paste to provide excellent stabilizing action against ultraviolet light.

Plastics Exhibit

(*Continued from page* 454)

Hyatt Award to Bailey

The 1950 John Wesley Hyatt Award for distinguished achievement in plastics was awarded to James Bailey, vice president and director of research, Plax Corp., on May 24. The presentation was made in ceremonies following a banquet at the Greenbrier Hotel, White Sulphur Springs, W. Va., as part of the SPI annual national conference on May 24 and 25. The award was presented by O. L. Patteson, governor of West Virginia, and Horace Gooch, Jr., Worcester Moulded Plastics Co. and SPI president, served as toastmaster.

Mr. Bailey received a gold medal and $1,000 in recognition of his research on machinery and techniques for the successful extrusion of thermoplastics. His developments include techniques for the production of polyethylene bottles; the continuous extrusion of flexible polystyrene sheet; and the rod extrusion in continuous lengths of cellulose plastics and polymeric resins. A graduate of Lehigh University, Mr. Bailey served with Corning Glass works from 1912-1929, organized the Bailey & Sharp Co. in 1929, and joined the Hartford-Empire Co. in 1937. Shortly thereafter he was transferred to Hartford's newly formed plastics division, Plax Corp., as director of research.

Melmac Prices Cut

THE plastics and resins division of American Cyanamid Co., 30 Rockefeller Plaza, New York 20, N. Y., has announced a price reduction of 20¢ a pound for the mineral-filled molding compounds, Melmac P-592 and P-592-A, effective June 1. Shipped in 250-pound containers, these compounds are now priced at 65¢ a pound in quantities of one drum or more, and 75¢ a pound in less-than-drum quantities. The materials are used primarily for electric insulating applications, such as in aircraft ignition systems.

NEWS of the MONTH

GSA Reduces Natural Rubber Price, and OPS Product Ceiling Prices Lose Planned Increases; Some Relaxation of Controls in Prospect

Although the picture was not too clear, the prospect of relaxation of some government controls of the rubber industry seemed likely in the course of the next few months.

The GSA announced June 21, several days earlier than expected, a reduction in the price of natural rubber sold to the industry from 66 to 52¢ a pound for #1 RSS, with appropriate reductions for other grades. The OPS, which has been working with its rubber industry groups to meet the deadline of July 2 for rubber product ceiling prices, found, in general that the planned increases in ceilings based on increased costs would be about equal to the reduction in cost resulting from the natural rubber price reduction; therefore ceiling prices would remain at about the existing level. Further calculations, however, might mean reductions in ceilings during the latter half of the year, it was added.

Details of RFC's plans for expansion of GR-S capacity in existing plants by about 100,000 long tons a year have been revealed. RFC Administrator W. Stuart Symington named a nine-Man Rubber Industry Advisory Committee to help him on problems of production and distributing synthetic rubber.

The Senate Small Business rubber subcommittee recommendations on the rubber program of May 28 were accepted in some instances by government agency chiefs but were rejected in other instances.

The NPA will place rubber allocations on a quarterly basis beginning July 1; importation of rubber products without limitation of natural rubber content will be continued; the present allocation of rubber at 100% of the base period for essential products and 90% for non-essential products will be continued for the third quarter; and the broadening of consumption limitations for small manufacturers will be "studied."

Industry earnings and outlook have been reported as very favorable for the remainder of 1951, with some narrowing of profits likely during the latter half.

Contract and wage increase negotiations have begun or will start during July for many rubber companies.

Washington Report

By

ARTHUR J. KRAFT

Rubber Policy and Stockpiling

Significant developments in overall rubber policy, apparently pointing toward relaxation rather than tightening of controls in coming months, were well under way in June. The government agencies concerned with rubber policy had agreed on a memorandum setting forth rubber policy and objectives for the months ahead, geared to the necessities of a possible all-out war. The statement was reportedly prepared by aides to Mobilization Chief Charles E. Wilson.

The Munitions Board, meanwhile, was reported working with revisions of the natural rubber stockpile requirement, pointing to an almost certain reduction in the present goal, it was said.

The Board was basing its recalculations on new specifications prepared by industry task groups to the National Production Authority. The tire and tube specifications had been submitted several months ago. In mid-May, the non-transportation segments submitted their revised specifications. Also going into the Board's calculations of a new stockpile requirement for a five-year war were estimates of probable requirements of our Western European allies for rubber from this country. These are new estimates submitted by the State Department and the Economic Cooperation Administration.

The revised specifications bear out industry technicians' belief that military rubber products can be made with considerably less natural rubber content, in many instances, than thought desirable when the specifications were last reviewed several years ago. The military has found, it has been reported, that it can reduce the specifications for certain widely used tires from 40 to 15% natural rubber without imparing service quality.

As to the current state of stockpile preparedness, recapitulation of public and private statements by officials in a position to know the facts yields an incoherent picture.

General Services Administrator Jess Larson, and more recently Manly Fleischmann of the NPA, have indicated that the respective programs they administer probably can be eased toward the end of this year. The chairman of the Munitions Board, John D. Small, on the other hand, was reported to have told the Senate Small Business subcommittee in closed session June 6 that the industry's estimates of the current state of the stockpile are on the high side.

Leland E. Spencer, NPA rubber division chief, told his rubber industry advisory committee May 28 that "the stockpile situation is still critical, and we're putting every pound we can get into it."

Any evaluation of these statements should take into account the circumstances under which they were elicited. Fleischmann made his statement when facing a House Banking committee critical of harsh controls on business. Small made his in arguing against proposals by small companies for easing up on rubber consumption restrictions. Spencer's statement was an answer to pretty much the same demand for the entire industry. Larson, of course, is interested in buying foreign crude natural rubber at lower prices. While these interests are related, the statements do not often make it obvious.

Natural Rubber Price Cut— Effect on OPS Price Ceilings

Larson announced June 21 that GSA would reduce its selling price for natural rubber to 52¢ a pound beginning July 1. The cut amounted to 14¢ a pound under the GSA selling price of 66¢ for #1 Ribbed Smoked Sheets maintained since the government became exclusive buyer of natural rubber Dectmber 29, 1950.

Larson, who said the new selling price is in line with the current world market, estimated that industry will realize an initial saving of nearly $40,000,000 in the next three months as a direct result of GSA's action.

"When GSA undertook the exclusive buying program with the full consent of industry, the price of rubber was in the high 70's. At that time the government stabilized the price to industry at 66¢ a pound and entered the world market as the sole U. S. purchaser in an effort to bring the world price down to a more realistic figure," Larson said.

"When we were assured," he added, "that our efforts to bring about price reductions would succeed, I announced (May 18) that GSA was not in the rubber business to make a profit, and that the savings resulting from a lowering of the world price would be passed along to industry as soon as rubber being bought at lower figures arrived in this country for resale. That time has now arrived."

The new price, pegged at 52¢ a pound for #1 RSS and comparable prices for other grades, will prevail for a period of at least 90 days," Larson declared.

"I trust," he continued, "that now industry will see that the consumer shares in his saving. Mr. DiSalle has assured me that his office will make every effort to see that this is done."

Larson's announcement of the rubber price cut came several days earlier than expected and immediately occasioned hurried consultation at the Office of Price Stabilization. That agency, later in the day, issued a statement promising that the cut "will be reflected in lower ceiling prices in the rubber industry during the second half of the year as the new rubber goes into production and distribution."

OPS rubber chief, Chester Conner, met with the Tire and Tube Industry Advisory Committee earlier on the same day. The industry group agreed that tire and tube manufacturers would waive an approximate 5% price increase they had coming to them on July 2 under the General Manufacturers Ceiling Price Regulation (CPR 22) in view of the impending cut in the price of natural rubber. The group agreed also to continue pricing under the General Ceiling Price Regulation, which pegged prices to the highest level prevailing from December 19, 1950, to January 25, 1951, pending the completion of a tailored price order for its industry and determination of the effect of GSA's rubber price cut.

OPS said it would issued a supplemen-

tary regulation leaving tires and tubes under GCPR. The supplementary order will be revoked when OPS is ready with a tailored regulation taking into account the lower price of natural rubber.

The full impact of GSA's action on price ceilings for rubber goods could not be ascertained in late June. The picture, however, seemed to shape up as follows:

At the time of GSA's announcement, various segments of the industry were in the home stretch of determining industry-wide cost adjustment factors to be used in tailored price regulations under CPR 22. Broadly, these permit price increases to offset increases in the costs of materials from June 24, 1950, through December 31, 1950 (or through March 15, 1951, in the case of imported materials) and for increases in factory payroll costs through March 15.

The probable effect in the tire and tube industry has been mentioned. Rubber footwear, heels and soles, rubber hose, and many rubber sundries, under the same broad criteria, were entitled to price increases ranging up to 7%. Manufacturers of these products also waived the increases.

It was not clear whether price decreases in prospect for miscellaneous items like rubber bands, thread, V-belts, and friction tape likewise would be deferred.

The OPS rubber branch made a spot check of tire manufacturing costs, based on the rubber going into tires and tubes during May under NPA allocations, and came up with the finding that the price cut ordered by GSA in natural rubber would reduce the cost of making tires and tubes about 5% — or roughly by the amount the price increase to which these manufacturers were entitled before GSA acted.

The rubber branch intends to follow up its spot check on tire manufacturing costs with additional surveying. Still undecided, however, was whether to superimpose a determination of the effect of the natural rubber price cut on data submitted or on the way at the time of the GSA announcement.

The alternative would be to make a complete recalculation of costs covering not only the new price for natural rubber, but also new prices established July 2 under CPR 22 for other materials used in tire manufacture, such as cotton and synthetic yarns and fabrics.

The prospect of a ban on price rollbacks was much in the mind of DiSalle when he said on June 21, "If Congress permits rollbacks where they are economically justified, the 14¢ a pound decrease in the price of natural rubber could mean up to $200,000,000 in savings annually to the consumer and taxpayer."

Officials speculated that if Congress banned rollbacks, tire manufacturers as well as other rubber product manufacturers who waived price increases would "have the right" to demand the increases to which they were entitled under CPR 22, regardless of any mitigating effect resulting from a lower priced natural rubber on their costs.

OPS officials in June, in talks and interviews, sought to correct the apparently widespread impression that the agency's industry earning standard was intended as a lid on profits. The standard provides for relief for manufacturers when the earnings of the industry drop below 85% of the average profits earned in the three best years of 1946-49, inclusive, period.

This point does not mean, OPS stressed, that the agency plans to roll back prices when profits for an industry exceed the 85% standard. The industry earnings stand, an OPS official said, "is a red flag to tell us when controls are too tight. The manufacturers ceiling regulation, on the other hand, tells businessmen what to do."

OPS has exempted from price controls sales of experimental rubber products until their sales exceed $1,000. The action was taken through Amendment 1 to General Overriding Regulation 3, effective June 2.

In effect, the amendment extends the same treatment to experimental rubber products as previously provided under GOR-3 for experimental chemicals and new chemicals sold in small volume. The amendment defines an experimental rubber product as "a product made substantially or in whole of natural, synthetic, substitute, reclaimed, or any other kind of rubber, in a temporary mold, or in a research or testing laboratory, or by hand process, or with temporary equipment."

When sales approach the $1,000 mark, the manufacturer must file a report with the OPS in Washington describing the product and stating the volume of production he would consider commercial rather than experimental.

Unless OPS disapproves or asks further information within 20 days, the rubber product will continue to be exempt until the stipulated commercial volume of production is attained, or until OPS disapproves the filed report. If and when an exemption is removed, the product will be subject to price control under the appropriate pricing regulation.

RFC Synthetic Rubber Expansion

The plan of the Reconstruction Finance Corp. to expand GR-S output by 100,000 long tons a year is nearing final form. The production goal, an annual rate of 855,000 long tons, would take some nine months to achieve, according to the agency's engineering estimates.

Cost of the project, which involves no brand-new plant building, has been put at somewhere around $4,200,000, the money coming from RFC's operating funds. The 855,000 tons contemplated would be half "cold" rubber and half "hot" rubber GR-S.

The production increase will be sought by such measures as installing additional reactors, additional refrigeration equipment, and, in some cases, a continuous system of polymerization. The 855,000-ton annual figure works out to 71,250 tons a month of GR-S. This GR-S production would require about 65,000 short tons a month of butadiene. The government's petroleum butadiene facilities can make more than 40,000 tons a month; while the alcohol butadiene installations are believed capable of producing some 15,000 additional tons. Use of the recently announced Dow Chemical Co.'s catalyst could bring the total output to the required amount.

Styrene supplies appear assured. Rubber Reserve's executive director, Gerald B. Hadlock, successfully negotiated a barter arrangement with the West German authorities for 7.5 million gallons of benzol early in June. Germany is to receive high octane gasoline in exchange. Although it was understood that Hadlock also sought European alcohol on his visit to Germany last month, RFC officials said no supplies were arranged for.

..Distribution of the contemplated expansion in GR-S output is noted in the following listing, with all figures representing monthly output in long tons: Copolymer Corp. at Baton Rouge, to be increased by 300 tons to 4,000 tons; Firestone, at Lake Charles, by 1,140 to 8,300; General Tire & Rubber Co., at Baytown, by 216 to 3,300; B. F. Goodrich Co., at Port Neches, by 275 to 7,500; Goodrich at Institute, by 880 to 9,700; Kentucky Synthetic Corp., at Louisville, by 550 to 3,750; Phillips at Borger, by 515 to 5,300; U. S. Rubber at Port Neches, by 1,100 to 7,500; Goodyear at Houston, by 1,320 to 8,040; Minnesota Mining & Mfg., at Los Angeles, by 1,940 to 7,700. No expansion is contemplated by Goodyear at Akron, Firestone at Akron, or by U. S. Rubber at Naugatuck. Present monthly production of these facilities, respectively, is 1,520, 2,500 and 2,100 tons.

The plans call for production of some cold rubber as well as some carbon black masterbatch on the West Coast, a point pressed for by 3M and Pacific Rubber Co. before the Senate Small Business subcommittee several months ago.

New RFC Committee

RFC Administrator Symington, on June 11, named a nine-man Rubber Industry Advisory Committee to help him on rubber problems. The committee met with Symington on June 18, at which time all members agreed to serve in a consulting capacity to the RFC Administrator, a spokesman for the agency said. The committee, he added, will not advise on allocations.

The initial meeting considered two aspects of RFC's rubber operations: the question of bringing in a greater number of companies as operators of synthetic rubber facilities and the terms under which RFC sells rubber to industry. No decision was reached on the first point, although there was agreement that the greatest number of operators feasible to the operation should be sought. The Senate Small Business subcommittee (Gillette) has indicated its interest in this matter and stated that it would call upon Symington to explain the role of smaller companies in the rubber plant operation.

At the advisory committee's request Symington promised to see what could be done to restore an earlier system of billing rubber purchasers 30 days after shipment. At present a purchaser must pay for the rubber before shipment. This policy has caused inconvenience to smaller companies particularly because of frequent shipping delays attributed to Rubber Reserve's low operating stocks.

Named to the new RFC committee were: John L. Collyer, president, B. F. Goodrich Co.; Harvey S. Firestone, Jr., chairman, Firestone Tire & Rubber Co; A. L. Freedlander, president, Dayton Rubber Co.; Frank D. Henderson, president, American Hard Rubber Co.; H. E. Humphreys, Jr., president, United States Rubber Co.; P. W. Litchfield, chairman, Goodyear Tire & Rubber Co.; Everett Morss, president, Simplex Wire & Cable Co.; Thomas Robins, Jr., president, Hewitt-Robins, Inc.; and J. Penfield Sieberling, president, Seiberling Rubber Co.

At his weekly press conference the morning of June 18, Symington explained that in deciding on the composition of the committee he wanted representation from the industry's Big Four and from companies representing various segments of the industry.

Senate Small Business Meeting

Senator Guy M. Gillette's Small Business rubber subcommittee met in closed session on June 6 with four representatives of its small-industry rubber "watchdog" committee to hear government witnesses on the 11-point series of recommendations drawn up the month previous by the full 21-man "watchdog" group.

Present at the meeting were Senator Gillette; the Small Business committee's

counsel, Charles Shaver; Leland E. Spencer; John D Small; Jess Larson, and the following members of the "watchdog" group: Donald F. Pratt, Durkee-Atwood, chairman; Furber Marshall, Carlisle Corp., vice chairman; Irving Eisbrouch, Dayton Rubber; and J. F. McCann, Dunlop Tire & Rubber Co.

Shaver said after the meeting that some of the industry group's recommendations were adopted in toto; others were partially rejected; while others were tabled for further consideration. He and Pratt reported that Spencer accepted the group's recommendation that allocations be placed on a quarterly basis beginning July 1, a step NPA had informed its own industry advisory committee at the May 28 meeting it would take.

Spencer also agreed to "study" the "watchdog" group's request that more small users be exempted from consumption limitations on total use of new rubber. He did not say when or how the exemption would be broadened, but he did say he would broaden it.

The NPA rubber director turned down flatly the demand that at least 120,000 tons of new rubber a month be channeled into consumption immediately. He agreed "seriously" to look into restoring the requirement that imported rubber products conform into natural rubber content specifiactions set forth in Appendix A of Order M-2 for domestic manufactures. The "watchdog" committee protested NPA's position that nothing should be done until harm actually occurs, as set forth in Spencer's statement to its rubber industry advisory committee on May 28. Spencer, the subcommittee spokesman said, indictaed that he would put the question before an interagency panel.

The group was assured that synthetic rubber expansion will be continued at least to the limits of the presently planned 100,000-ton expansion, and that specification controls will be continued after the present emergency to assure widespread and large-scale use of synthetic rubber.

A recommendation calling for complete elimination of inventory curbs on tires and tubes was tabled for a future meeting. The "watchdog" group was scheduled to meet again in late June with Gillette.

NPA Activities

The NPA announced May 28 it would continue the May rubber allocation program through the third quarter of this year. This action means that rubber goods manufacturers will be permitted to consume new rubber in civilian goods at 100% of the base-period rate. Consumption will continue to be limited to 90% of base-period use for the non-essential items listed in Appendix B to M-2.

Spencer told the rubber industry advisory committee that allocations will be put on a quarterly basis beginning July 1. It was reported that no manufacturer will be permitted to use more than a third of his allocation in any one month.

Spencer rejected a demand from some members of the committee that more rubber be allowed in making twin-bead and other large-size truck tires. (A spokesman for the truck-trailer manufacturers, who have led the fight for more rubber for twin-bead tires, said in late June that the supply situation is no longer critical. Tires are now available in better quantities, but the bottleneck is now axle-wheels on which to put the tires.)

NPA informed its advisory group it was sending out forms to rubber goods manufacturers to determine production capacities. The agency also assured the committee that the rubber industry will be allocated the steel, copper, and aluminum, under the controlled materials plan taking effect July 1, which it needs to meet the "essential rubber program."

Spencer also told the committee that the current practice of maintaining an inventory of about 25,000 long tons of synthetic rubbers would be continued to assure equitable distribution and prompt delivery to purchasers.

He likewise told the committee that the policy adopted May 1 of permitting importation of rubber products without limitation on their natural rubber content would be continued "until it is determined that domestic manufacturers are being hurt by the practice."

NPA issued figures showing actual consumption of rubber in civilian goods in the first quarter and estimates for the second and the third quarters of 1951. These figures show an increase in total usage from 265,000 long tons in the first quarter to 283,200 tons in the second and 294,200 in the third quarter. On top of this estimate, new rubber going into military goods is expected to be considerably greater in the third quarter than estimated second-quarter usage of 35,000 tons.

NPA's figures for civilian use, all in long tons, follows: GR-S consumption was 127,700 tons in the first quarter and is expected to rise to 133,000 tons in the second quarter and 149,300 in the third quarter. Butyl, at 15,900 in the first quarter, was put at 14,500 in the second and 16,800 in the third. Total synthetics was 158,800 in the first and is expected to be 163,500 in the second and 181,600 in the third. Dry natural rubber going into civilian goods was 90,600 tons in the first quarter and was estimated at 103,600 in the second quarter and at 96,500 in the third. Natural latex use was put at 15,600 in the first and at 16,100 in the second and third.

These figures add up to a consumption of new rubber in civilian goods of 842,400 tons for the first nine months of this year. Projecting third-quarter estimated use as an annual rate, the civilian consumption of rubber will soon be running at a rate of 1,176,800 long tons a year. Military usage may add another 150,000 long tons.

The NPA put sulfur under allocation on June 2, when it issued Order M-69, restricting consumers to their 1950 use. Limited production in the face of rising domestic demand and the need to maintain substantial exports to Britain and Europe dictated NPA's action.

Consumers of sulfur are required to report by June 28, and by the twenty-eighth day of each succeeding month, on the amount of sulfur used in the preceding month and the amount in inventory at the close of that month. This report must be made on form NPAF-98. Other information to be submitted on this report is an estimate of consumption in the current month and inventory at the end of the current month.

Suppliers of sulfur, likewise, are required to file monthly reports with NPA. After July 1, suppliers must have NPA authorization for each shipment exceeding 60 short tons per quarter for a single user. Consumers using 20 tons or less a month are not required to submit monthly reports.

Other Industry News

Industry Earnings and Outlook

The Wall Street Journal on June 11 carried some interesting information in a quite comprehensive survey of the earnings and outlook for the rubber goods industry in the current year, under the title of "Robust Rubber."

Mid-year reports from the various companies will show sales increases ranging up to 90% over like months of 1950, and there are strong indications the trend will continue, making 1951 the best year by far in the history of most companies, it was said. Earnings will be good, too, better than a year ago, but with few exceptions they will not stack up to percentage increases in sales. First-half earnings will be substantially greater than for a year ago for all companies. For 1951, however, gains are expected to narrow down as more facilities of the industry are put on lower-profit defense production. Also, taxes and higher costs will make for a smaller ratio of net to sales as the year progresses, and reserves which may be set up by companies to take care of possible price declines will have an effect on final results.

Comments on individual companies were, in part, as follows:

Firestone Tire is enjoying substantial revenues, exempt from excess profits taxes, from its large foreign rubber plantations as a result of high prices for rubber so far in the current fiscal year to end October 31. In the January quarter sales showed an increase of 55% over those a year earlier, and this trend is believed to have been maintained during the April quarter, making the half year the best in company history from a sales standpoint.

General Tire is expected to show the greatest percentage gain in sales for the first half of its current fiscal year of any major company, largely because it was hit somewhat harder than most when business declined in early 1950. The company recently announced it is setting up a new chemical division. It is in this type of activity that some other rubber companies have made considerable profits in the recent past.

Anticipated higher net income for Goodrich materialized in the March quarter, and it is understood the trend continued to the June quarter, *The Wall Street Journal* said.

Goodyear is headed this year for membership in that once exclusive club of billion-dollar businesses. Sales for the March quarter were about 70% ahead of those in the same period in 1950. Indications are that the trend is continuing in the June quarter despite a drop in civilian production.

U. S. Rubber's second-quarter earnings will not equal those of the first quarter, but will be considerably ahead of those a year ago. Sales in the first quarter were more than 60% ahead of sales in the same period last year and at a rate which is continuing in the present quarter.

Among other rubber companies, American Hard Rubber reports sales at a rate 80% above those a year ago. Dayton Rubber expects to operate at capacity at least for the remainder of the current fiscal year ending October 31. Sales of Lee Tire & Rubber Corp. in the six months ended April 30 were 86% ahead of sales in a comparable period a year ago. Current operations are on a two-shift, five-day week basis.

Production at Seiberling Rubber will be about the same through June and July as it was in May. Management anticipates the last half will be as good as at present, probably better. Truck tire production will be scheduled on a six-day work week for at least the next two months. Sales of automobile floor mats have dropped off in recent weeks, and production is on a

five-day week until sales pick up. Heel and sole operations are on a normal five-day-week basis.

Baldwin Rubber Co. was on a six-day week until recently to keep up with demand. The company also has been making soles and heels for Sears Roebuck Co. In July, Baldwin Rubber expects to start shipping bushings for tank treads, produced in large volume in World War II.

In the first four months of this year, sales of Denman Tire & Rubber Co. were about equal to those for the entire first half of 1950. Rubber shortages have necessitated allocation of tire recapping supplies and hard rubber textile machinery parts that Denman sells. Demand for camelback used in passenger tire recapping is at about World War II levels.

Mansfield Tire & Rubber Co. expects sales for the current half to be about 50% above sales in the first half of 1950. About half this company's business is on a cost-plus basis, as in private brands of tires and tubes were the profit margin remains pretty constant.

Mohawk Rubber Co. is believed to have a greater percentage of its volume in defense orders than any other rubber company today. Mohawk shows promise of establishing another new record in sales this year, topping last year's record.

The very excellent earning record of Tyer Rubber Co. was also mentioned in the *Journal* article.

Labor News

A series of strikes plagued Goodyear during June. Most of the work stoppages occurred at the Akron, O., plants. At the beginning of the month a wildcat strike at Akron plant C manufacturing Pliofilm stopped production of this product for several days. Then 135 workers at the synthetic rubber plant operated by Goodyear left their jobs on June 6 and had not returned to work by June 21, at which time the workers were suspended for seven days. On June 12 a wildcat strike started at Plant 2, and passenger-car tire production was halted. On the same day a dispute at the Goodyear Aircraft Corp. plant idled 6,000 workers.

The local United Rubber Workers union, on June 21, handed Goodyear a five-day notice to cancel its present contract with the company. A strike affecting 14,000 workers could be the result of such a notice. Representatives of the union and the company immediately began negotiations in order to prevent such a strike.

Working conditions, union officials said, are the crux of the present trouble although higher wages would be asked as soon as the new agreement on working conditions is signed. The union and the company were trying to work out a supplemental contract covering employes in Goodyear plants in Akron. Goodyear and the international URWA union negotiated a master contract covering all the firm's plants in March.

An additional five-day truce was announced June 24 as the negotiators continued their efforts to reach agreement on the supplemental contract.

Mohawk in Akron was shut down completely June 6 because of a wildcat strike which began in the mill room and spread throughout the plant. Company officials said the workers in the millroom walked out, demanding higher pay on certain jobs. A union spokesman blamed poor health and ventilating conditions in Plant 2 of this company.

U. S. Rubber and the URWA began negotiations in New York on June 7 in connection with a new working contract and wage scale. The question of a union shop was also a major factor in negotiations between the union and the company.

URWA asked Goodrich to begin negotiations on another round of wage increases on June 6. Talks are scheduled to begin in New York on July 10.

EAST

Changes at Goodrich

William L. Carpenter, production superintendent of The B. F. Goodrich Co. tire plant in Miami, Okla., has been made manager of the company's tire plant in Oaks, Pa., to succeed James F. Sweatt, now manager of the tire plant in Los Angeles. Mr. Carpenter has been with Goodrich for 16 years. Before going to the Oklahoma plant last year he was assistant to the general manager of the company's tire division.

G. Allen Spaulding, with Goodrich since 1940, has been made production superintendent at the Miami tire plant.

Harlan L. Trumbull, who helped establish the Army's Chemical Warfare Service during World War I and developed a method for making artificial latex dispersions from rubber, has retired after a 32-year career in research with Goodrich. During World War II, Dr. Trumbull worked on many major government assignments and made two inspection tours of German synthetic rubber operations. In 1946 he served as manager of research and development for Rubber Reserve Corp. In 1947, Dr. Trumbull was named by the American Chemical Society as one of the 10 "ablest chemists and chemical engineers" working in the American rubber industry.

Harry N. Stevens, formerly director of patents and abstracts at the Goodrich research center, Brecksville, O., has been named director of colloid and textile research. Stevens, with the rubber company since 1935, assumes duties formerly directed by Dr. Trumbull.

Wade C. Ruble, manager of employment in Goodrich's Akron operation, has been transferred to the Los Angeles tire plant as personnel manager. Paul R. Levering, who held that post, is now in Akron as an employe relations representative, reporting to D. D. Reichow, director of union relations.

Ruble has been with the company since 1940, when he started as a scheduler in the industrial products division. He later became a floor foreman there and in 1947 an employe relations counselor. He was made manager of factory employment three years ago.

Levering has been with Goodrich for 23 years, starting as a clerk in the tire division and becoming an industrial engineer 18 months later. In 1939 he was named manager of tire scheduling and in the same year was appointed personnel manager at Los Angeles.

The associated tires and accessories division has promoted two men and added another to its organization.

R. L. Garman has been advanced to special field representative and will assist W. A. Green, manager of special accounts in contacting oil company accounts east of the Rockies and in merchandising programs on tires and accessories. Garman will also handle special field assignments for Green and for M. G. Huntington, division general manager.

Forest E. Hoot, from the accessories department, repaces Garman as a special accounts representative for tires and accessories and will cover parts of Illinois Michigan, Indiana, Ohio, and Kentucky.

Paul Mason, former Indianapolis district farm tire representative for Goodrich, has joined the division as field representative for farm tire sales to oil companies.

Howard E. Fritz, vice president-research, William L. Davidson, director, physical research, and Waldo L. Semon, director, pioneering research of the Goodrich company, are in Europe on a six-week visit to laboratories and research facilities in England, Denmark, France, Germany, Italy, Holland, Sweden, and Switzerland. They also will attend meetings of the SCI in England.

Thermatomic Advances Two

Clark C. Boardman has been appointed a vice president of Thermatomic Carbon Co., according to J. Albert Woods, chairman of the board. Mr. Boardman was formerly manager of the company's Sterlington, La., plant and has been succeeded by Robert W. Cretney, previously plant superintendent.

Mr. Boardman, formerly assistant general manager of Western United Gas & Electric Co., joined Thermatomic in 1923.

Mr. Cretney, also formerly with Western United Gas came to Thermatomic in 1923.

Thermatomic Carbon Co., an affiliate of Commercial Solvents Corp., 17 E. 42nd St., New York 17, N. Y., is a producer of special types of carbon blacks.

United Buff Products Corp., Passaic, N. J., manufactures the patented Airflow "Pressure-Cooled" buffing wheel, recommended for finishing operations on many hard rubber items. The wheel is also suitable for plastics, wood, stainless steel, copper, silver, and other materials. Ready for use as supplied, the wheel requires no breaking-in period or inserts, spacers, or dividers. Messy "ashing" operations are eliminated, and the buff permits faster finishing with no risk of rejections owing to burning, warpage, distortion, or flow, even on thin sections, it is also claimed. The engineered buff is available in various constructions and densities for specific applications and will polish any contour without difficulty. One buff can be used for rough polishing, fine polishing, and finishing.

Witco Chemical Co., 295 Madison Ave., New York 17, N. Y., gave 20 of its carbon black salesmen a tour through the manufacturing plants in order to provide them with a better understanding of the products they distribute. Max A. Minnig, sales manager of Witco's carbon black division, took the group through Continental Carbon Co.'s plants in Amarillo and Sunray, Tex.; Barnhart Hydrocarbon Corp's plant in Big Lake, Tex.; and Continental Oil Black Co.'s plant in Lake Charles, La. After inspecting Witco's newly enlarged plant and laboratory in Chicago, Ill., the group flew to Texas on May 30 and returned to Chicago June 3.

PR

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HAF (High Abrasion Furnace)
STATEX-R

◆

FF (Fine Furnace)
STATEX-B

◆

FEF (Fast Extruding Furnace)
STATEX-M

◆

HMF (High Modulus Furnace)
STATEX-93

◆

SRF (Semi-Reinforcing Furnace)
FURNEX

◆

COLUMBIAN CARBON CO.
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For Greater Productivity

General Electric Co., chemical department, Pittsfield, Mass., has installed a 208-ounce pre-plasticizing injection press, made by Jackson & Church Co., at its molding plant in Decatur, Ill. Designed to produce plastics articles weighing up to 13 pounds, the press can be easily converted to mold much larger items. Now in production on large refrigerator components, the machine was installed in anticipation of the coming trend for larger thermoplastic molded parts. Company officials predict that complete refrigerator interiors, kitchen cabinets, and new-type fluorescent lighting fixtures molded in one piece from plastics may some day be rolling off production lines. Weighing 135 tons and standing 27 feet high, the new press incorporates a patented feature that gives accurate control of pressure being applied in the mold, thereby permitting close control of products quality. Pre-plasticizing equipment in the press permits the coloring and molding of certain types of plastics in one operation. Capacity of the machine is rated at 1,000 pounds an hour of polystyrene on a continuous production basis.

G-E's chemical division has also announced the expansion and modernization of its plastics mold making facilities at Pittsfield, Mass. Described by H. M. Brusman, manager of the plastics division, as an integration of mold making operations to service the division's Decatur, Ill., and Taunton, Mass., molding plants, the modernized tool room covers 40,800 square feet, twice the area of the former operation. Similar machine tools are grouped together for efficient operation, and the entire floor area is serviced by electric cranes. Machinery capable of tooling large molds has been installed in anticipation of the trend toward larger moldings. One section of the new tool room is devoted exclusively to the construction of mold frames, thereby permitting concentration of actual mold manufacture in areas laid out to provide a steady production flow. Tool room facilities at the Decatur and Taunton plants will be retained for mold maintenance.

Replacing Wood in Bobbins

The G-E plastics division has announced that jute bobbins molded of G-E 12808, a flock-filled nitrile rubber-phenolic compound, are replacing wood in bobbins because of the greater strength, lighter weight, and lower cost of the jute bobbins. Molded by Jacobus Plastics, Jacobus, Pa., for the Revonah Spinning Mills, the rubber-phenolic bobbins eliminate the chipping and splitting encountered with the wood bobbins formerly used in spinning carpet jute. The new bobbins provide outstanding resistance to impact and also faster calculation of shipping weights because of their greater uniformity of size and weight, it is further claimed. Other new markets are expected to be opened up for plastics applications as a result of the G-E rubber-phenolic development.

Personnel Changes

Robert D. Buzzee, of the chemical department, has been appointed buyer for the plastic division. Mr. Buzzee came with G-E on the engineering training course in 1941 from the Fisk Tire Co., where he had worked in the development laboratory. In 1942 he was transferred to the chemical department's methods and equipment laboratory; in 1943 was assigned to the Taunton, Mass., plastics molding plant as a product engineer; in 1949 returned to Pittsfield in the central quotation section, and in 1950 was transferred to mold manufacture as a manufacturing engineer.

O. O. Barton has been appointed priorities supervisor of the chemical department, responsible for matters dealing with government priority regulations. Mr. Barton started with the company in 1928 in Schenectady, N. Y., on the business training course, was transferred to the accounting section of the Meriden, Conn., plant in January, 1931, and a year later was transferred to the accounting section in Pittsfield. In 1946, Mr. Barton returned to Meriden as assistant to the manager and in 1949 was transferred to the Taunton, Mass., plant as supervisor of production and order and stores.

Piccolyte Resins Again Available

Pennsylvania Industrial Chemical Corp., Clairton, Pa., resumed Piccolyte Resins production on June 25 at Clairton. Shipments of the resins were discontinued after May 29 following a disastrous fire and explosion that destroyed the manufacturing facilities of the company's supplier of beta-pinene, the starting raw material for the resins. With no supplies of beta-pinene on hand, Pennsylvania was forced to stop production of the resins and used a small emergency stock to supply DO-rated orders during the stoppage. Equipment at the company's Chester, Pa., plant, formerly used to fractionate styrene from xylene, was converted to fractionating alpha- and beta-pinene, and production of beta-pinene started on June 21. Initial production of the resins was at approximately 65% of capacity and scheduled to increase in about three weeks to full capacity. The converted beta-pinene equipment at Chester has been completely isolated and supplied with feed tanks, pumps, lines, storage tanks, etc., for use in any similar emergency in the future. The company states that this converted equipment may be kept in operation even after the time that normal supplies can be received from the raw material suppliers in order to bring about a substantial increase in the production of Piccolyte Resins.



Paul O. Powers

Powers Joins Pennsylvania Industrial

Paul O. Powers has been named chemical director of Pennsylvania Industrial Chemical Corp. and will be concerned with coordinating research activities, technical service, chemical laboratory work, and pilot-plant operation in the development and maintenance of synthetic resins, solvents, oils, and other Picco products. He also will continue as an adviser to the National Research Council on Quartermaster problems.

During the past 20 years Dr. Powers has been active in the synthetic resins field and has done considerable work also on the development of control methods for determining applicability of synthetic resins in the plastics and coating fields.

Dr. Powers is the author of "Synthetic Resins and Rubbers," and of chapters and sections in several standard reference works. He holds numerous patents in synthetic chemistry and is the creator of a series of charts on preparation of synthetic resins and rubbers which are used as standard references.

He has been associated with Atlantic Dyestuff Co., Calco Chemical Co., New England Color Works, Newport Industries, Inc. and Battelle Memorial Institute. He also taught chemistry for three years at the University of Pittsburgh and was a Research Fellow at Mellon Institute of Industrial Research.

Timken Appointments

The Timken Roller Bearing Co., Canton 6, O., last month announced several executive changes, as follows.

H. J. Urbach has been made executive engineer. He served with the Nebraska State Highway Department before coming to Timken in 1933. Since that time he has been with the railroad engineering division and the diesel pump division as service engineer and since 1946 has been works engineer for the company. Mr. Urbach is a member of ASTE and the Society of Automotive Engineers.

R. A. Schimpf is now chief works engineer. He joined Timken in 1928 and in 1936 was transferred to Columbus as assistant manager of the diesel fuel pump division and later became assistant superintendent. He was also resident engineer at Timken's Mt. Vernon plant and utilities engineer of the Canton division before his new appointment.

L. A. Holder, now chief mechanical engineer, has been with the company since 1928. During the war Mr. Holder was on the engineering and packaging subcommittee of the War Department and engineer on the industry integrating committee for Armor Piercing Ammunition and also served as a civilian analyst with the United States Strategic Bomb Survey in the E.T.O. He is a member of the American Ordnance Association, ASME, and ASTE.

C. H. Maratta has been named chief consulting engineer of Timken. He started with the company on June 4, 1917. During this time he has filled the positions of plant maintenance engineer and chief works engineer.

Form Chemical Company

The formation of the American Petrochemcial Corp. for the manufacture of essential chemicals from petroleum hydrocarbons was announced May 28 by Harvey S. Firestone, Jr., chairman of Firestone Tire & Rubber Co., Akron, O., and W. Alton Jones, president of Cities Service Co. The new company has developed plans for construction of a large, modern chemical plant whose production would ultimately encompass the broad fields of plastics, synthetic rubber, additives for lubricating oil, cracking catalysts, anti-freeze chemicals, and many high-volume petrochemicals. A site at Lake Charles, La., is under consideration for the new plant. Cities Service owns and operates at Lake Charles a 160,000-barrel refinery which would be a source of supply of light hydrocarbons for the chemical plant. Firestone operates a government-owned synthetic rubber plant adjacent to the refinery. Ownership of the new corporation will be equally divided between Firestone and Cities Service.

A $62,000,000 contract for the construction of new-type three-inch twin antiaircraft guns and mounts has been awarded to Firestone by the Navy Bureau of Ordnance. This contract covers tooling, materials, and spare parts, and some 1,200 persons are expected to be employed in Akron when production begins. Many of the machined parts will be manufactured by sub-contractors. Equipment needed for the parts of the units to be manufactured by Firestone will be installed in the company's Plant 3 at Akron.

Other Firestone News

An honorary degree of Doctor of Laws was conferred on Harvey S. Firestone, Jr., chairman of Firestone, by the University of Akron at its seventy-ninth annual commencement. University President H. E. Simmons conferred the degree upon Mr. Firestone, who was cited by Dean R. D. Landon for his services to his company, community, and country.

Chemical fumigation of soil is facilitated by the use of a new plastic seed-bed cover called Fumi-Cover, made of Firestone's Velon. A sturdy four-gage vinyl film, Fumi-Cover is gas-tight and permits the effective use of methyl bromide for eliminating weeds and soil pests. The extreme durability of the film enables it to be used for season after season, it is further claimed, and its light weight permits convenient handling and application. Fumi-Cover is made by Besmar Products Corp., Binghamton, N. Y., and is being given national distribution.

Ideal Toy New V. P.'s

Miss Mary T. Meidenbauer has been elected vice president of Ideal Toy Corp., Hollis, L. I., manufacturer of dolls and plastic toys, David Rosenstein, president, announced last month. Miss Meidenbauer, first woman to be elected to Ideal's board and one of the few women executives in the toy industry, will continue as head of production, buying and designing for the company's entire line of dolls. She joined Ideal in 1928 as a designer and soon thereafter was put in charge of the department.

Rosenstein also announced the election of Irving Cohen and I. H. Bernhard as vice presidents.

Coolidge Succeeds Bolton

Cole Coolidge on June 4 was appointed director of the chemical department of E. I. du Pont de Nemours & Co., Inc., Wilmington, Del., to succeed Elmer K. Bolton, who retired June 30 after 21 years as director. Dr. Coolidge will direct the research activities of the chemical department, which are concerned primarily with long-range and fundamental research.

The department's pioneering-applied research comprises investigation of new processes and new products in the fields of synthetic fibers, films, coating compositions, plastics, agricultural chemicals, detergents, photographic processes, pigments, and synthetic rubber.

Dr. Coolidge joined the department as a research chemist in 1923. Within three years he was made a group leader, directing other research workers along special lines. In 1927 he was named assistant director of the du Pont Experimental Station, near Wilmington, and served as such until 1939, when he was appointed assistant director of the department.

Much of his own research work has been along broad lines in organic chemistry, with emphasis on certain phases of rubber chemistry, synthetic resins, and new coating compositions and plastics. It has also included exploratory work in pigments and on cellulose derivatives. Alone or with other coinventors, he has been granted 16 patents on a variety of subjects.

In 1915, Dr. Bolton joined du Pont at the Experimental Station and the next year was placed in charge of a group of chemists to study the preparation of synthetic dyes. This was the beginning of a long association with the chemistry and manufacture of dyes. He became director of the chemical section of the dyestuffs department in 1921, when the present plan of decentralized research was put into effect. He remained in this capacity until 1929. During this period he had responsibility for research on a wide variety of organic chemicals, including dyes and dye intermediates, rubber accelerators, rubber antioxidants, flotation agents, tetraethyl lead, and seed disinfectants. Dr. Bolton was made assistant director of the chemical department in 1929 and director in 1930.

He is particularly recognized for his leadership in the synthesis of the first general-purpose synthetic rubber to be developed either in this country or abroad and for his direction of nylon research.

William A. Bours III has been named manager of the plants development section of du Pont's organic chemicals department. He succeeds George E. Holbrook, now assistant director of the du Pont development department. Mr. Bours started with the company 10 years ago as an industrial engineer in the engineering department and after eight years became chief supervisor of the development section at Chambers Works, Deepwater Point, N. J. The next year he was made manager of the fine chemicals sales development section of the organic chemicals department and early this year was appointed senior technical assistant in the technical laboratory at Deepwater Point.

National Association of Waste Material Dealers, Inc., last month moved from Times Bldg., New York 18, N. Y., to larger quarters at 271 Madison Ave., New York.

Expanding Foam Operations

The foam rubber capacity of Hewitt-Robins, Inc., New York, N. Y., will be increased by 50% through the acquisition of the rubber plant of Belfer Corp., Staten Island, N. Y., it was announced by Thomas Robins, Jr., president of Hewitt-Robins. With plants at Buffalo, N. Y., and Passaic, N. J., Hewitt-Robins, a leading producer of foam rubber, is also one of the largest independent manufacturers of conveyer belting and machinery, hose, and other industrial rubber products.

Robins disclosed that under the arrangement his company will purchase for cash all machinery in the Belfer plant, presently used for the manufacture of foam rubber pillows and mattresses, and will lease the buildings, including a pier, for 13 years.

Located at Pier 23, 191 Edgewater St., on Lower New York Bay, the Belfer plant has a manufacturing area of 136,000 square feet. The pier, with deep water berthing space, is 665 feet long.

With the deep water pier, Hewitt-Robins will be in a position to receive bulk liquid latex by ocean tankers for use at the Staten Island plant and for transshipment to its main foam rubber operation at Buffalo. The Buffalo foam rubber plant, in addition to operating those facilities at full capacity, is building substantial quantities of self-sealing gasoline tanks for the Armed Forces.

Robins stated his firm's plans for expansion are based on a general easing in the overall rubber supply. He said that with government stockpiling now in sight of its goal, and the synthetic rubber industry operating at virtually 100% capacity, rubber latex will soon be in ample supply, barring the spread of war.

Hewitt-Robins expects to continue in its employment all personnel currently on the Belfer payroll.

Arthur Belfer, president of Belfer Corp., in a statement regarding the sale said he planned to continue to devote all his time and the resources of his company to the rapidly expanding government demand for sleeping bags. The company is currently a large maker of sleeping bags for the Armed Forces.

Brown Co. Elections

Laurence F. Whittemore, president of Brown Co., 150 Causeway St., Boston 14, Mass., has announced that at a recent directors' meeting in Boston all officers of the company were reelected.

It was also announced that John W. Jordan, secretary since 1943, has been promoted to vice president and general counsel. Mr. Jordan prior to joining Brown Co., practiced law for 12 years in New York.

Other officers reelected are: Mr. Whittemore, president; E. H. Maling, vice president in charge of finance; H. G. Brush, vice president and treasurer; Wentworth Brown, vice president and assistant to the president; D. P. Brown, vice president in charge of sales; H. G. Schlanche vice president in charge of woods operations; W. J. Oleson, Jr., controller; Mr. Jordan, secretary; C. G. Raeburn, assistant treasurer and assistant secretary; Douglas Mercer, assistant secretary; and Leonard A. Pierce, clerk.

General Buys Tool Concern

The General Tire & Rubber Co., Akron, O., is investing more than a million dollars in expanding its metal products division with the purchase of Grieder Machine Tool & Die Co., Inc. Bowling Green, O., as the principal part of this expansion program. Final details of the purchase of the Grieder plant have been completed, and General has taken over the facilities.

General's metal products division now is under contract to do intricate transmission work for aircraft and fire control systems. Work of this nature will be moved into Bowling Green as soon as the facilities are ready. It is likely that much of the plant's capacity will be utilized on three shifts with a potential employment of 600.

The general manager of General's Bowling Green plant temporarily will be George E. Smith, also coordinator of the company's government business. Smith came to General six years ago from the Crosley Corp., where he had served as operating vice president.

Works manager of the Bowling Green plant will be Clarance Clyne, formerly in charge of manufacturing for Bell & Howell.

General's metal products division has a plant in Cuyahoga Falls, O., and in addition to doing machine work for the Armed Services, it also makes tools and machines for General Tire's domestic and foreign plants.

Powers Promoted

John E. Powers has been appointed trade sales manager at General Tire. Effective immediately, the new assignment carries with it the responsibility of General's replacement tire sales program and also the direction of the Akron and field sales personnel.

Powers has been in the tire industry since 1925 and all his experience has been in the sales end of the industry, mainly in executive capacities. He joined General in 1934 as a territory sales representative, but in 1939 he was promoted to assistant eastern division sales manager and in 1942 was appointed manager of the New York branch, largest of General's branches. Powers came into Akron in 1944 as a member of Akron's sales executive staff and in 1946 was named manager of automobile tire sales.

Allied Chemical & Dye Corp., Barrett Division, 40 Rector St., New York 6, N. Y., has applied for a certificate of necessity to cover additional facilities for the production of synthetic phenol at its Philadelphia, Pa., chemical plant. The projected expansion, which includes power, storage, and warehousing facilities, involves a total expenditure in excess of $8,000,000 and would treble Barrett's phenol production capacity. The new plant would utilize a new process for the synthesis of phenol, based on work conducted at Allied Chemical's central research laboratory at Morristown, N. J. The new process does not involve the use of sulfuric acid or chlorine in any form, both of which materials are in short supply. Phenol is widely used in the manufacture of resins and insecticides, in the refining of lubricating oil, and as an intermediate in the manufacture of dyestuffs.



Vernon W. Colby

Emery Industries, Inc., Carew Tower, Cincinnati 2, O., has advanced Vernon W. Colby to an assistant chemical sales managership, supplementing the activities of Robert T. Hull, also an assistant chemical sales manager, and Robert F. Brown, chemical sales manager. Mr. Colby, after several years as a dyer and then service with the Armed Forces, became associated with Emery in a sales capacity. Prior to his recent appointment, he covered Connecticut, Rhode Island, and eastern New York State.

Jammal Resigns

Vulcanized Rubber & Plastics Co., Morrisville, Pa., on May 29 gave a farewell dinner to Nicholas J. Jammal, works manager and a director of the company, who resigned to become a partner in Hershburg Products Co.

The dinner was at the Hotel Hildebrecht, Trenton, N. J., and about 120 guests took part. Prescott Beach, president of the company, was toastmaster. Stanley H. Renton, chairman of the board, Hugo Mercantini, president of the local union, and Henry Golightly, of McKinsey & Co., were among the speakers. Several parting gifts were presented to Mr. and Mrs. Jammal from company officers and employes.

On June 1, Local 123, United Rubber Workers Union (CIO), had Mr. Jammal as guest of honor at its union hall, in Morrisville.

Mr. Jammal was with Vulcanized since 1937, when he started as a night foreman. In succession he became chief inspector, rubber superintendent, and, in 1944, works manager. Previously, he had been with Advance Rubber Co.

Hercules Powder Co., Wilmington, Del., has announced the availability in commercial quantities of Dresinol 155, a new non-solvent type of high-melting resin dispersion. Dresinol 155 can be used as a modifier and extender for natural or synthetic rubber latices in adhesives, supported films, and binders of all types. The new material is said to be completely compatible will all types of latices.

To Broaden Scope

Seiberling Rubber Co., Akron, O., on June 24 announced formation of a "new projects" department, to invent or develop products the company may make in the future.

President J. P. Seiberling said the move is a step toward greater diversification of the company's production, now confined principally to tires and tubes, heels and soles, and floor mats.

Arthur A. Leedy, a 29-year company employe who has been director of engineering, was named manager of the department. He will be assisted by Alfred S. Bachtel and Henry A. Walter, both veteran production department employes.

The "new projects" men will confine their activities to product research, Seiberling said, and will not duplicate work of the company's development department.

"We want to expand into new lines," he declared, "but only those on which we know we can do a better job than is now being done. It will be up to this department to find these lines."

Seiberling did not specify the products to be developed, but indicated that the new department might experiment in foam rubber products, mechanical rubber goods, or any of thousands of products made with rubber, synthetics, or plastics.

Milton R. Rodman, assistant credit manager for Seiberling, has been named credit manager, according to W. H. Oburn, assistant treasurer. Rodman, a 27-year employe, held positions in Seiberling district offices at Chicago, Kansas City, Dallas, and Denver, before his appointment to assist Oburn, then credit manager, in 1937.

New Selling Agent

The firm of B. J. Barry & Co., Inc., New York, N. Y., perpetuating a name famous in textiles since 1900, has been appointed sole selling agent for The W. A. Handley Mfg. Co., Roanoke, Ala., producer of "San Juan" duck and other heavy cotton goods specialties. Barry has also been appointed sole selling agent for Massapoag Mills Corp., Lincolnton, N. C., manufacturer of drapery fabric specialties, army and enameling ducks. Massapoag Mills have under way a building and machinery installation program which to date has more than doubled capacity.

James A. Kelliher, president of the Barry company, has been active for the past 34 years in marketing the products of various southern cotton mills. He was with Curran & Barry since 1917, most recently as sales director.

Lawrence E. McDonnell, secretary-treasurer, was associated with the late Bartholonew J. Barry in the management of his various mill interests prior to joining the new organization.

Troy Engine & Machine Co., Troy, Pa., has appointed Wetherbee Chemical Co., 1510 S. Park Ave., Buffalo 20, N. Y., sales representative for its process machinery division in the western New York State territory. Headed by Burt Wetherbee, this firm represents several well-known concerns serving process plants, particularly those in the rubber, paint, and plastics fields. Wetherbee Chemical will be sales representative for Troy roller mills, colloid mills, and mixers.

Heads Ideal Plastics

A. M. Katz has been elected chairman of the board of Ideal Plastics Corp., Hollis, L. I., with which he has been associated for 40 years. He is also treasurer and general manager of Ideal Toy Corp.

Katz has named Alfred C. Manovill and Lionel Weintraub vice presidents, with Manovill assuming the duties of general manager of the industrial molding program. Manovill, who joined Ideal in 1945, has been with the plastics industry since 1924 and is a Pioneer and former director of the Society of the Plastics Industry.

Ideal Plastics has launched a $5,000,000 expansion program to meet the rising demands of defense and consumer production. According to Mr. Katz, the first major addition to the company's equipment will be the installation early in mid-summer of two 300-ounce injection molding machines, made by Watson-Stillman Co. Addition of these giant machines to the 80 molders already in operation at Ideal will raise the company's production potential to about 4,200,000 pounds a month, among the highest in the country. The new machines, designed to produce molded parts weighing as much as 26 pounds, will permit the firm to offer parts heretofore unobtainable in single-unit production.

Mason Promoted

James N. Mason has been named executive vice president of Interchemical Corp., coated products division, New York, N. Y., and he is also serving as chairman of the unit's defense contract and development committee. Under Mr. Mason's direction the latter has developed three new processes—rubber latex coating of fabrics, vinyl plastisol resin coating of fabrics, and vinyl and rubber latex saturation of fabrics. All are now in defense production at Interchemical's coating plants in Winthrop, Me., and Buchanan, N. Y., with civilian and industrial applications being studied.

Before joining Interchemical in 1949 as executive vice president of its standard coated products division, Mr. Mason for eight years was with O'Sullivan Rubber Corp., Winchester, Va., serving consecutively as superintendent, plant manager, vice president, and executive vice president, and a director. During 1941-42, he was plant superintendent, Victor Products Reclaim Corp., Hagerstown, Md., and during 1931-41 was plant manager of the Quabaug Rubber Co., North Brookfield, Mass.

Serving with Mr. Mason on the defense committee are Edgar S. Thompson, in charge of development, and John A. Bessler, divisional vice president, directing sales.

Seamless Rubber Co., New Haven, Conn., has leased more than 100,000 square feet of space in the building at Congress and Howard avenues, New Haven. About September 1, after extensive alterations, the rubber company will transfer its sales, advertising, and shipping departments to the new address. Seamless facilities will then cover 475,000 square feet. This change is the result of a heavy backlog of orders.



Dale F. Behney

Behney Now Sales Manager

Harwick Standard Chemical Co., Akron, O., has appointed Dale F. Behney manager of sales. This announcement, released by Jack R. Moore, president of the company, indicates that Mr. Behney will now head up all sales activities for this company throughout the country. Five branch offices with warehouse facilities are presently maintained by Harwick, and all are staffed with technical sales representatives.

Mr. Behney joined Harwick in May, 1950. He was with Goodyear Tire & Rubber Co., serving in development, tire design, and technical service until 1939. In 1940 he was made supervisor of Banbury train and later, compounder for airfoam development. In 1941 he became purchasing agent of equipment for Defense Plant Corp. and Goodyear Synthetic Rubber Corp., then was made chemical buyer of Goodyear's chemical division.

On Scrap Rubber Committee

Eight representatives of firms belonging to the National Association of Waste Material Dealers, Inc., have been appointed to the executive committee of the Association's Scrap Rubber Institute by the latter's president, Henry M. Rose, H. Muehlstein & Co., Inc. The committee members are as follows: John J. Costello, Tanney-Costello, Inc.; Thomas Crosby, H. Muehstein; Louis Fishman, Louis Fishman & Co.; Ben Gordon, A. Schulman, Inc.; Irving Levin, Superior Iron & Metal Co.; A. Lowenstein, A. Lowenstein Co.; P. F. Mekeal, Desser Tire & Rubber Co.; and Seymour Sacks, Ed Sacks Co.

The "Ichthyologists," Boston Chapter, American Institute of Chemical Engineers, recently elected the following officers for 1951-52: Kingfish, C. A. Stokes, director of research and development, Godfrey L. Cabot, Inc., Mackerel, Prof. J. E. Vivian, Massachusetts Institute of Technology; Smelt, R. Antonsen, Cabot; Shark, Peter Rinaldo, Dewey & Almy Chemical Co.; Past Kingfish, A. W. Fisher, Jr., A. D. Little, Inc.

Moves to Larger Quarters

Argus Chemical Laboratory has moved its plant, offices, and laboratory to 633 Court St., Brooklyn 31, N.Y. The new site will enable Argus to triple its production of "Mark" stabilizers and "Vinylum" aluminum powder dispersions and to further its development of new products, several of which will soon be introduced. The new facilities include four laboratories, complete with mill room, glass blowing room, and a comprehensive library.

Argus Chemical was formed several years ago by Olga Knoepke, W. E. Leistner, and A. C. Hecker, following many years as chemists in the rubber and vinyl field. The firm's first offering to the trade was "Vinylum". When the "Mark" stabilizers were added, the initial plant was overtaxed, and a new location, with possibiities for additional expansion became necessary.

The "Mark" stabilizers, according to the company, are being used with considerable success in high-speed high-temperature operations of calenders and extruders, where they aid greatly in the maintenance of uniform color during long production runs, and in the production of vinyl goods resistant to heat and light.

Plant for Plastics Film

Victory Plastics & Embossing Corp., Brooklyn, N. Y., will place in operation by July 1 its new plant at Harvey, Ill., to produce embossed and laminated Vinylite plastic film and sheeting. With printing equipment to be placed in operation soon thereafter, the plant will turn out a diversified line of printed, embossed, and laminated film and sheeting. Situated close to the Bakelite Co. plant at Ottawa, Ill., which supplies the Vinylite plastic materials, the new plant is designed to meet the increasing demand for Victory's products in the Midwest and Far West areas. The new factory, which comprises some 12,500 square feet of floor space, will process film and sheeting ranging from 0.004- to 0.020-inch in thickness and chiefly 54 inches in width. Plans are already in progress for further expansion of facilities and equipment as demand increases.

The new plant will be operated under the supervision of Donald A. Stolzenbach, formerly with Hotpoint, Inc. West Coast sales will be handled by A. B. Boyd Co.; while Midwest sales will continue to be handled by E. E. Raymond and George H. Curtis Co.

National Association of Cost Accountants, 505 Park Ave., New York 22, N. Y., held its thirty-second annual international cost conference at The Palmer House, Chicago, Ill., June 24-27. Among the members of the conference committee were L. C. Bollinger, Ideal Roller & Mfg. Co., Chicago, Ill.; David P. Fry, Jr., Pioneer Suspender Co., Philadelphia, Pa.; and Rowland H. Lutz, Columbus Coated Fabrics Corp., Columbus, O. James E. Caldwell, assistant comptroller, Goodyear Tire & Rubber Co., Akron, O., participated in a panel discussion on "Supplementary Costs of Labor" at the June 27 session.

Goodyear Expanding

Goodyear Tire & Rubber Co., Akron, O., is starting in Topeka, Kan., a multi-million-dollar expansion of tire building operations there. Plant capacity, will be increased 50% with the addition of a building 1,000 by 250 feet to the present Topeka factory.

Goodyear also is negotiating for the purchase of 70 acres of state-owned land across the highway from the plant. This land, is required for future planning and additional parking, recreational, and other facilities.

Five hundred employes will be added to the payroll when the expanded production gets under way. The Topeka personnel currently numbers 1,000.

Increased demands for high styrene-butadiene copolymers for specialized uses in the paint industry have led to the establishment of a special paint development laboratory within Goodyear's chemical division. The new laboratory will be headed by J. J. O'Neill, who will devote most of his time to further refinements and uses for Pliolite S-5, which has been widely accepted by the paint industry for the formulation of chemically resistant finishes, stucco and concrete paints and enamels, plaster sealers, highway striping paints, machinery enamels, and aluminum finishes. O'Neill has some 10 years' experience in the paint industry as a research and development chemist and is the holder of several patents on the development of petroleum resins.

Goodyear directors on June 25 authorized a two for one split in the common shares of the company. It will apply to stock of record August 15.

Personnel News

Thomas Kerr, Airfoam representative at Los Angeles, has been transferred to the company's main offices for the handling of special accounts, and is succeeded on the West Coast by Dean E. Oakes, Sr., of the Akron Airfoam staff.

Mr. Kerr has had 15 years' experience with Goodyear, starting with the squadron. In 1941 he was placed in charge of property records at the Goodyear Engineering Corp., Charlestown, Ind., in 1949 shifted to the Pacific Coast as a representative of the general products Division, and last year was named Airfoam field representative there.

Mr. Oakes joined Goodyear in 1945 as a factory office trainee, was transferred to the St. Marys, O., plant in 1946 in the mechanical goods sales department, and returned to Akron and the Airfoam division as senior staff man last year.

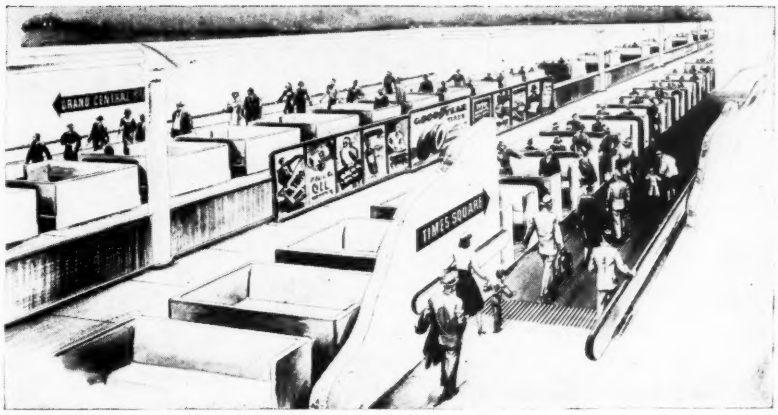
Stanford Bryan has been appointed to the cycle tire sales organization in Akron. With Goodyear for 10 years, Bryan comes to Akron from Grand Rapids, where he was with the service department. In his new duties he will be responsible for handling and processing bike tire and tube orders, which are becoming increasingly heavy in volume.

Addition of Bryan to the staff will permit T. F. Judge, senior staffman in the department, to devote more time to duties in the field.

E. J. Thomas, president of Goodyear, at Akron University's seventy-ninth annual commencement exercises received an honorary degree of Doctor of Laws for "outstanding service to country and community".

In the presentation, it was pointed out to the commencement audience that Thomas "has served with rare distinction in the fields of American industry and government as a member of the National Industrial Conference Board, an officer of N.A.M., an officer of the National Aeronautical Association, and member of the President's Labor Management Conference."

Westminster College recently conferred an honorary degree of Doctor of Humanities on the Goodyear executive.



Artist's Drawing of Entrance View to Loading Platform of Proposed Conveyer Belt Subway System to Replace 42nd St. Shuttle; Cars Are Shown without Plastic Tops and Doors

Product Developments

Goodyear has developed portable street warning signal pylons for emergency use by electrical, water, gas telephone, and sewer workers on busy traffic arteries. Made of a special inflatable rubberized fabric, the pylons can be quickly erected and equipped with flashing signal lights to warn traffic of obstructions. Initial pylons were made in six- and 12-foot heights when inflated, but both sizes can be packed in small containers for carrying when deflated. The pylons are made up of two air chambers bonded together to form an approximate right angle, when inflated, and reinforced with cross-supports at the back for added rigidity. The pylon base, also made of rubberized fabric and resembling a small life raft, is filled with water to moor the pylon firmly in its desired position.

Plans for a radically new passenger subway system, utilizing the continuous loading principle of the conveyer belt, have been engineered by Goodyear and Stephens-Adamson Mfg. Co. and submitted to the New York City Board of Transportation. According to R. S. Wilson, Goodyear vice president, the system was designed specifically as a low cost and more efficient replacement for the present shuttle under 42nd St. between Times Square and Grand Central Station, but may be adaptable to many other subway problems. The new plan calls for the use of slow-moving loading and unloading platforms, and small, closely spaced passenger cars riding on an endless track of rubber conveyer belts and rubber tired banks of accelerator wheels. As shown in the accompanying illustration, passengers at either end of the shuttle walk directly upon the loading platform, a six-foot wide belt moving at a speed of 1½ miles an hour. Alongside the loading platform and moving at the same speed is a continuous stream of small passenger cars, each seating 10 passengers. Once past the platform the cars move over banks of rubber tired wheels which speed them up and carry them on to another conveyer belt moving at 15 miles an hour. The cars are slowed down at the other end of the shuttle by similar banks of wheels on to belts moving at the speed of the unloading platform. Advantages claimed for the belt system include continuous operation to relieve rush hour congestion, reasonable installation cost, and low maintenance and operating costs.

Whittaker, Clark & Daniels, Inc., 260 West Broadway, New York 13, N. Y., has completely recovered from the fire that destroyed the sample room and stock of talc and metallic soap catalogs at its South Kearny, N. J., plant. The sample room has been rebuilt, and the catalogs replaced by a new printing. All requests made previous to the fire have been filled, and inquiries are now being handled as received.

Diamond Alkali Co., Cleveland 14, O., has completed a six-step modernization expansion program at its electrolytic chlorine and caustic soda plant at Army Chemical Center, Md. According to Plant Superintendent James H. Fall, Jr., the rehabilitation project represents a capital improvement investment of nearly $400,000 and has resulted in an increase of about 30% in output of caustic soda and chlorine. The program consisted of the following steps: (1) new chlorine purification equipment; (2) placement of all chlorine loading activities under a single roof; (3) a new "sniff gas" recovery system for chlorine gas; (4) installation of a new centrifugal-type chlorine compressor; (5) replacement of brine and centrifugal pumps in refrigerating section with complete new units; and (6) installation of additional refrigeration compressor.

H. I. Cramer, director of development, Sharples Chemicals, Inc., 123 S. Broad St., Philadelphia 9, Pa., has accepted a temporary assignment with the Office of Price Stabilization, Economic Stabilization Agency, as Chief, Aliphatic Chemicals — Rubber Chemicals Section, Rubber, Chemicals & Drugs Division.

For More Paracril

Naugatuck Chemical Division, United States Rubber Co., Rockefeller Center, New York 20, N. Y., on June 26 announced a major expansion program aimed at doubling production at its Baton Rouge, La., Paracril synthetic rubber plant. Plans call for the construction of a new administration building, laboratory, gate house new reactors, drying units, and other production equipment, and new warehousing and latex storage facilities.

This expansion program will bring capacity for the production of Paracril nitrile rubber, Nitrex latex, high styrene latex, and high styrene resins to approximately 30,000,000 pounds annually.

Work is expected to begin within a month. The expansion will be completed early next year.

The plant was purchased by Naugatuck Chemical late in 1950 from Esso Standard Oil Co. It is one of the oldest synthetic rubber plants in existence. The first commercial batch of GR-S synthetic rubber produced in the United States was made at this plant in December, 1941, under a cooperative program by technicians of Esso and U. S. Rubber.

Paracril rubber is used in self-sealing fuel cells and bullet-sealing hose for military aircraft and for critically needed oil-resistant rubber products. High styrene latex is a major ingredient of water-based paints and is finding an expanding use in paper coating applications. High styrene resins in combination with Paracril are in strong demand for injection molding and extrusion operations. Nitrex is Paracril in latex form used in paper, textile, and leather finishing applications.

Opens New Office; Wins Safety Award

U. S. Rubber has opened a new office in the New Center Bldg., Detroit, Mich., to house automotive sales personnel who handle original equipment sales of certain rubber products to the auto industry. About 25 of the 225 people in the company's branch office, 5850 Cass Ave., who are responsible for this activity, will be involved in the move.

These groups are the engineered rubber products division, headed by Frank Urban, which sells shock mounts, steering wheels, belts, and about 200 other rubber parts to car manufacturers and their suppliers, and a group from the footwear and general products division, headed by F. A. Sawyer, whose products include automotive foam cushioning and floor mats, coated fabrics, and plastic items.

The L. H. Gilmer Division plant at Philadelphia, Pa., was honored by national, state, and city officials on June 7 in recognition of its perfect safety record during 1950. Approximately 500 of the plant's 719 full-time employes gathered on the plant grounds to see the ceremonies, which included the presentation of a plaque from the National Safety Council, the Pennsylvania "Certificate of Honor," and an award from the Philadelphia Safety Council. The awards were received by Factory Manager John R. Tomlin.

Changes In Personnel

Richard C. Emmons has been made sales manager of Koylon foam mattresses, Koylon foam pillows, U. S. rug underlay, and U. S. non-slip in the company's national branch sales organization. Mr. Emmons, who came to the rubber company in June, 1936, spent his first three years in the foam division at the factory; in April, 1939, he became a salesman of foam mattresses in the Boston branch and in January, 1941, was transferred to Kansas City as a special salesman for foam mattresses. After military service Mr. Emmons returned to U. S. Rubber early in 1946 and served successfully as a salesman in the Chicago branch, assistant to the district sales manager there, district sales manager of the Denver branch, and district sales manager of the Detroit branch.

Gerald J. Gleason, since September, 1945, district manager of the Buffalo branch, has been made district manager at Detroit, responsible for sales of footwear, clothing, Koylon foam mattresses, pillows, rug underlay, non-slip and general products. Mr. Gleason has been with the rubber company in sales capacities since 1923.

The new district sales manager of Buffalo branch is Frank J. Yohan, since January, 1951, assistant district sales manager in that area. He started with the company as a salesman in the Syracuse branch in July, 1939, was transferred to Buffalo in July, 1941, and after military service returned to Buffalo late in 1945.

Thomas N. Redfern has been appointed plant engineer of the Providence, R. I., plant and Peter J. McGuire has been named to fill Mr. Redfern's former position of assistant plant engineer. Mr. Redfern has been employed by the U. S. Rubber since 1920. During World War II he personally supervised the opening of several subsidiary plants for the company. He became assistant plant engineer in 1949.

Mr. McGuire has been with the company since 1945. He started as a project engineer and was elevated to supervising project engineer in 1947.

Stephen A. Ward has been appointed assistant to the plant manager of U. S. Rubber's combed yarn mill in Gastonia, N. C. He was transferred from the company's rayon tire cord mill in Scottsville, Va. Mr. Ward has been with the company since 1936, serving at Winnsboro, S. C., Hoganville, Ga., and Scottsville. In 1947 he became assistant to the plant manager at Scottsville.

Elmer L. Johnson, Jr., has been appointed assistant to the manager of the plant at Scottsville. He will also continue as industrial relations manager of the mill, a position he has held since 1946. He joined the rubber company in 1944.

Development In Plastics

U. S. Rubber has developed a new air drying plastic protective coating which can be used to protect tanks, tank cars, pipes, fittings, structural steel parts, and chemical processing equipment against attack by weathering, rust, and corrosive chemicals or atmospheres. In pilot-plant production at the company's Providence, R. I., plant, the new product will be marketed by the mechanical goods division under the trade name, U. S. Royalguard protective coating. While suitable for many processing operations, the coating cannot be used in food processing because it imparts a slight odor and taste.

The plastic coating combines high film flexibility with good adhesion and impact resistance. The coating will not chip or crack and can be used on steel, aluminum, concrete, hard wood, and composition board. It is applied by spray, requires no primer, and can be produced in a variety of colors. Since the material contains no chemical plasticizer to leach out or harden, the coating retains its flexibility throughout its service life. To assure a good bond for the coating, metal surfaces should be grit or sand blasted prior to coating, cement should be etched with hydrochloric acid, and wood or composition board should receive a rough sanding.

A new plastic cutting board for meat packing plants, which is claimed to wear four to five times longer than wood, has been announced by U. S. Rubber's mechanical goods division. To be marketed under the trade name U. S. Royal cutting board, the new product is easy to clean, does not harbor bacteria, and maintains a neat, sanitary appearance. Made of a combination of thermoplastic material and nitrile rubber, the boards are available in sizes ranging up to 42 square feet, and in thicknesses of ½-, ¾-, and one inch.

Ensolite, a flexible expanded plastic that is light in weight and has great buoyancy, is another product of U. S. Rubber. The material is being used as a vest and watertight face seal in quick-donning battle suits being made for the Navy. In a life vest Ensolite, it is claimed, adapts itself easily to body contours and stays afloat for long periods because of its resistance to moisture absorption and its non-interconnecting cellular structure. Based on its shock absorbing qualities, other applications foreseen for Ensolite include protective wrappings for delicate instruments that are air dropped, eye pieces for gunners, head rests for aerial photographers, and protective body pads for athletes. The plastic is now available in a range of densities from 4-15 pounds per cubic foot, in flat sheets from ⅜-inch to 1½ inches in thickness, and it can also be molded in contoured shapes.

Expanded Royalite, a new expanded plastic for use in life rafts, life ring buoys, and other flotation equipment, has been developed by U. S. Rubber. The material is honeycombed with millions of tiny, non-connecting cells which make it extremely light. In addition, it is strong, unaffected by sun or salt water, will stay afloat indefinitely, has little or no moisture absorption, and has excellent thermal insulating properties. Other applications of the expanded plastic include sun helmets and commercial fishing floats. Life rafts of the material can be molded in one piece in sizes large enough to support 60 men, yet will stay afloat after strafing because of their non-inflated structure, it is further claimed. The plastic is manufactured in flat sheets which can be formed by conventional thermoplastic techniques, or it can be molded to shape. Density can be varied from 5-35 pounds per cubic foot, depending on the application, and standard sheets come in sizes of 46 by 70 inches and thicknesses of ¼-, ½-, ¾-, and one inch.

Eagle Industries, Inc., supplier of used machinery and equipment, 110 Washington St., New York 6, N. Y., according to Secretary-Treasurer Gilbert B. Kahn, has moved to larger quarters at the same address and has increased its personnel in order to give customers the efficient attention required to meet their needs for equipment necessitated by the present mobilization program.

Quality PRODUCTION FOR *Quality* PERFORMANCE

Calco Rubber Chemicals

...a line of top quality chemicals for rubber processing...the products of years of research which has established—and maintained—Calco leadership.

ACCELERATORS

Thiazoles

MBT (Mercaptobenzothiazole)

MBTS (Benzothiazyldisulfide)

Guanidine

DPG (Diphenylguanidine)

DOTG (Diorthotolylguanidine)

Accelerator 49

Calco®

ANTIOXIDANT

Antioxidant 2246*

(Non-staining, non-discoloring type)

PEPTIZER

Pepton® 22 Plasticizer

RETARDER

Calco Retarder PD

*Trade-mark

STIFFENING AGENT

Calco S. A.

SULFUR

Rubber Maker's Grade

AMERICAN Cyanamid COMPANY

CALCO CHEMICAL DIVISION
INTERMEDIATE AND
RUBBER CHEMICALS DEPARTMENT
BOUND BROOK, NEW JERSEY

SALES REPRESENTATIVES AND WAREHOUSE STOCKS:
Akron Chemical Company, Akron, Ohio • Ernest Jacoby and Company, Boston, Massachusetts • Herron & Meyer of Chicago, Chicago, Illinois H. M. Royal, Inc., Los Angeles, Calif. • H. M. Royal, Inc., Trenton, N. J. • In Canada: St. Lawrence Chemical Company, Ltd., Montreal and Toronto

WEST

For Easier Financing

Foreign and domestic subsidiaries of Minnesota Mining & Mfg. Co., St. Paul, Minn., will be given greater freedom of operations, particularly in matters of financing, as a result of actions taken June 14 by stockholders and debenture holders of the parent company. Stockholders approved three amendments to the certificate of incorporation. Debenture holders approved similar amendments to the indenture of 1947 under which the company issued $10,000,000 in bonds.

John L. Connolly, 3M secretary and general counsel, said one effect of the amendments is to give foreign subsidiaries freedom to finance themselves directly through local borrowing and issuance of stock rather than obtaining American dollars from the parent company.

The amendments also permit the parent company to increase its guarantee of domestic subsidiary debts from $1,000,000 to $5,000,000 and to raise from $2,000,000 to $5,000,000 aggregate maximum amount of funded debt or debt for money borrowed which may be incurred or assumed by domestic subsidiaries.

The changes in regulations governing foreign subsidiary operations were made necessary by recent changes in 3M methods of conducting foreign business, company officials explained.

Until April 30, 1951, 3M operated in foreign markets through minority holdings in Durex Abrasives Corp., an exporting company, and The Durex Corp., which operated manufacturing plants in Germany, England, Canada, Australia, and Brazil and a merchandising plant in Argentina.

Since then 3M has purchased 84% of the stock of Durex's British subsidiary and all the stock of the Brazilian and Argentine subsidiaries. It has also acquired control of the non-abrasive assets of Durex's German and Canadian subsidiaries.

In addition, 3M has acquired control of Durex Abrasive's Mexican subsidiary and has agreed to purchase that firm's French subsidiary.

Dow Chemical Co., Midland, Mich., plans a new plant to make vinyltoluene (meta- and pare-methylstyrene) which will do much to ease the shortage of styrene resulting from the scarcity of benzene. Vinyltoluene is made from toluene and ethylene instead of benzene and ethylene, according to R. H. Boundy, general manager of Dow's plastics division, and in all trials to date appears to be a satisfactory substitute for styrene in the manufacture of some synthetic rubbers, plastics, and coatings. Because of pressing defense needs, authorization of the construction of the new plant was given by the company's directors after a relatively short period of pilot-plant operation. Present plans call for breaking ground for the new plant at Midland late this fall, and production is expected to be under way by July of next year.

Interstate Rubber Products Co. recently moved to a new plant at 908 Avilla St., Los Angeles, Calif.

Miscible Bag Compounding Patent

A five-party interference suit in the United States Patent Office concerning a "Method of Mixing Rubber" has been settled, and a basic patent will soon be issued. As a result of the litigation, F. Jermain Chandler, president of Paton-Chandler Process Co., Detroit, Mich., has signed a joint agreement with the Standard Oil Development Co., Elizabeth, N. J., for the purpose of granting licenses to rubber companies to use the new process.

The process involves the packaging of carbon black and other rubber compounding materials in bags made of miscible polymer films compatible with the rubber mixtures; the bags are deposited unopened in the Banbury mixer. The process has been subjected to exhaustive tests. Standard Oil Development used films made of its S-polymers; while Du Pont used polyethylene film in assaying the commercial value of the process. Several large rubber companies have also proved that rubber compounds are not adversely affected by the process, which gives savings because of better quality control of compounds and elimination of dusting in the mixing operations.

Phillips Petroleum Co., Bartlesville, Okla., at its recent annual meeting of stockholders voted to increase the authorized common stock from 10 million to 20 million shares and approved a two-for-one split of the outstanding stock effective at the close of business on June 19, 1951. These changes double the number of common shares outstanding, but do not affect the capital or surplus of the company.

Arrowhead Rubber Co. has leased and is rebuilding a 27,000-square-foot building in Long Beach, Calif., to house its ducting division. Occupancy is scheduled for this month.

CANADA

New Polymer Officers

J. D. Barrington was appointed president and managing director of Polymer Corp., Ltd., Sarnia, Ont., on June 9. Mr. Barrington, president of Light Alloys, Ltd., and vice president and general manager of Dominion Magnesium, Ltd., succeeds E. J. Brunning, who served as president of Polymer since 1946. Mr. Brunning resigned as president owing to the pressure of other work, but will continue as chairman of the board. E. R. Rowzee, formerly plant manager, became vice president and general manager of Polymer, following the resignation of J. R. Nicholson. Mr. Barrington also fills the vacancy on the board of directors caused by Nicholson's resignation.

L. D. Dougan was appointed plant manager, with direct responsibility for coordination of production and plant operation. At the same time J. W. Henley became personnel manager and a member of the company's management committee.

Rubber Consumption Up

The Bureau of Statistics reported that consumption of all types of rubber in April in Canada amounted to 8,855 tons, against 6,176 in April, 1950. Consumption of natural rubber totaled 4,769 tons, against 3,477; synthetic, 2,417 tons, against 1,640; and reclaim, 1,669 tons, against 1,059.

Domestic production of synthetic rubber and reclaimed rubber reached 5,118 tons, compared with 4,947 in April, 1950, comprising 4,632 tons of the former, against 4,604 and 486 tons of the latter, against 343. Month-end stocks of all types aggregated 9,961 tons, compared with 11,624 on April 30, 1950. Inventories of natural rubber totaled 4,890 tons, against 5,272; synthetic, 3,069 tons, against 4,700; and reclaim 2,002 tons, against 1,652.

Imports Cut Production?

The Rubber Association of Canada, through Manager Greig B. Smith, expressed the belief that the Canadian rubber industry will face steadily increasing competition from imports during the months ahead. Speaking at the Association's annual meeting, Mr. Smith stated that imports of Czechoslovakian footwear and Japanese rubber toys "at prices well below Canadian manufacturing costs" are causing concern. The reduction of Canadian duties on rubber products on June 6, as a result of the Torquay international tariff agreements, will probably further increase the flow of imports. Canadian imports of rubber goods last year set a record at $14,543,000, but 1950 exports of $12,153,000 were only slightly below those for 1949. There are indications that the export trade will continue to improve even though British import taxes affect sales of Canadian footwear abroad, Mr. Smith said.

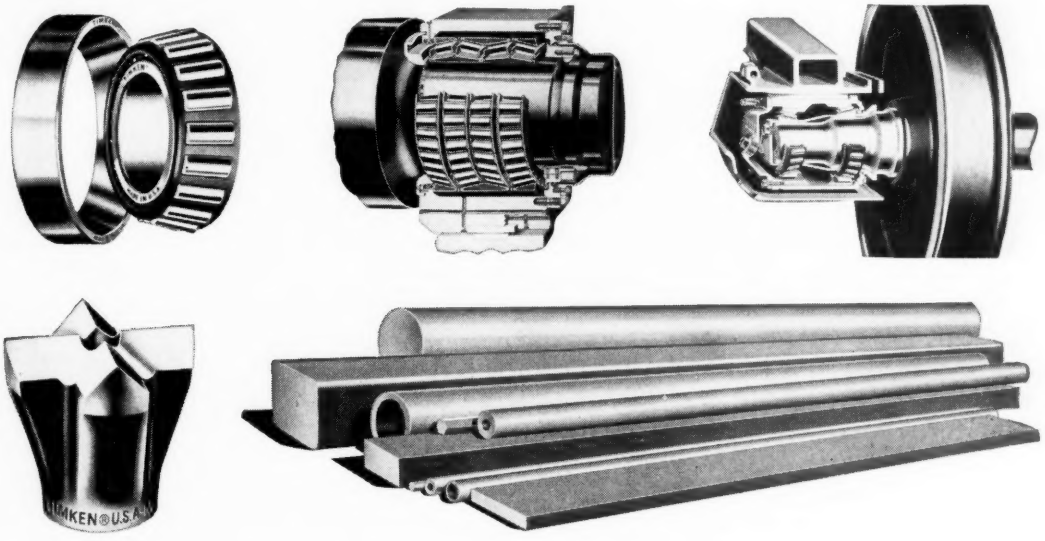
Association President C. C. Thackray, Dominion Rubber Co., Ltd., stated that as a result of international developments during the past 12 months, the Canadian rubber industry has been plagued by skyrocketing prices of raw rubber, shortages of other materials, and uncertainty as to the probable volume of military orders and whether the industry would be subjected to government control.

Imports of rubber tires into Canada in March are reported by the External Trade Section of the Bureau of Statistics as follows: pneumatic tire casings, for vehicles, 1,593, value $124,768; inner tubes, 864, value $5,598; solid rubber tires for automobiles and motor trucks, 41, value $1,181; solid rubber tires for vehicles, value $9,727; rubber tire repair materials, value $23,951; automotive parts of rubber, $198,207; manufactures of rubber, $331,306; rubber weatherstripping $165,428; pneumatic tire casings for bicycles, 4,575, value $6,603; inner tubes for bicycles, 1,118, value $677.

Frank D. Evans, of the development and production departments of Naugatuck Chemicals, division of Dominion Rubber Co., Ltd., Elmira, Ont., has been appointed sales manager for this division. He has been with the company since 1945 and prior to that time had been chief chemist with General Engineering Co., Ltd.

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The trade-mark "Timken" assures you of getting the highest quality tapered roller bearings, fine alloy steel bars, steel tubing or rock bits—all products of The Timken Roller Bearing Company.

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NEWS ABOUT PEOPLE



John A. Gotshall

John A. Gotshall has joined the sales staff of Binney & Smith Co., 41 E. 42nd St., New York, N. Y., according to M. Hamilton, manager of pigment sales. Mr. Gotshall will be located in the Akron, O., office. His first business connection was with Goodyear Tire & Rubber Co. selling shoe materials. In March, 1942, he transferred to the company's chemical engineering division and from 1945 to 1947 was in charge of the viscose rayon pilot plant. From 1948 until 1951 he handled the synthetic and chemical pilot plant.

Julian Paul has been appointed an assistant product manager in the fine chemicals department of Carbide & Carbon Chemicals Co., a division of Union Carbide & Carbon Corp., 30 E. 42nd St., New York 17, N. Y. His work will involve the development of markets for new plasticizers, solvents, and stabilizers. He succeeds James J. Morris, who recently joined the National Production Authority in Washington. Mr. Paul has been with Union Carbide for 15 years — the past three with the foreign department and prior to that with the pilot products plant and the process development laboratory at South Charleston, W. Va.

Simon Collier, director of quality control, Johns-Manville Corp., New York, N. Y., was elected vice president of the American Society for Quality Control at its recent convention in Cleveland, O.

Louis Nagy recently was elected a director and vice president in charge of research and development at Parker, Stearns & Co., Inc., 288 Sheffield Ave., Brooklyn 7, N. Y. Mr. Nagy, who started with the company in 1937 as a chemist and later was made chief chemist, has done considerable work in developing special applications for synthetic rubbers and in the field of vinyl plastics. His earlier experience had been gained in the general laboratories of Goodyear Tire & Rubber Co. and in the compounding department of Firestone Tire & Rubber Co.

Henry Avery has been appointed manager of the plasticizer division of Pittsburgh Coke & Chemical Co., Grant Bldg., Pittsburgh, Pa., where he will be responsible for directing and coordinating the division's expanding sales, production, technical service and development activities. During his war service, mostly in Ordnance, Mr. Avery received the U. S. Legion of Merit and an Italian Government medal. In May, 1947, after a year at the Florida naval stores plant of Godfrey L. Cabot, Inc., Mr. Avery was transferred to Cabot's Boston headquarters as plasticizer sales and product development engineer, where he was responsible for the sales and development of vinyl plasticizers, particularly new plasticizers based on isooctyl alcohol.

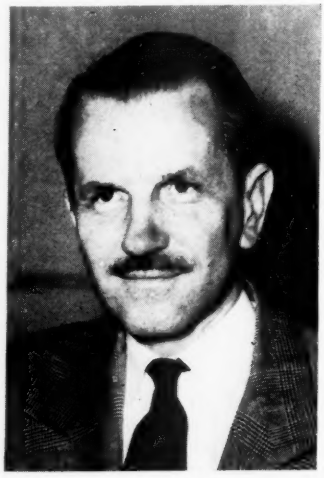


Henry Avery

Frank F. Silver has been appointed assistant factory manager of the Akron, O., plant of The Mohawk Rubber Co. He had been on the engineering staff for eight months. He was formerly with The Goodyear Tire & Rubber Co., and his last assignment was in South Africa, where he was in charge of the technical service and tire design for 3½ years. In 1943 and 1944 he was in Calcutta, India, for Goodyear doing technical work for the Air Force at the Dunlop factory, producing airplane tires. He started with the Goodyear training squadron at Jackson, Mich., in 1942.

Henry H. Stiller, vice president of Advance Solvents & Chemical Corp., New York, N. Y., and **Gerry P. Mack,** director of technical research, recently returned from an extended European trip, visiting England, France, Italy, Switzerland, Germany, Belgium, and Holland. The exclusive sales representatives of Advance Solvents throughout Europe are handling an ever-increasing volume of business in vinyl stabilizers and plasticizers as well as various specialties manufactured by this company for the paint industries. Business conditions abroad are generally favorable; however, the usual complaints regarding the increased cost of living are heard everywhere.

C. L. Taylor, Jr., recently joined Marbon Corp., 1926 W. 10th Ave., Gary, Ind., as chief engineer in charge of all engineering work. He was formerly a production engineer in the Ansco Division, General Aniline & Film Corp., Binghampton, N. Y.



Henry C. Speel

Henry C. Speel has been appointed director of the development department of Wyandotte Chemicals Corp., Wyandotte, Mich. Mr. Speel has had extensive experience in market research and development work over the past 20 years with General Dyestuffs Corp., Atlas Powder Co., General Mills, Inc., Alrose Chemical Co., and General Aniline & Film Corp. He is the author of a number of technical articles on polyhydric alcohols, surface active agents, natural colloids, and chemicals used in pharamaceuticals, cosmetics, and textile processing, all products which are being studied in Wyandotte's expanding organic chemical program. Mr. Speel will direct all phases of market development and technical service for Wyandotte's new organic products.

King Daywalt has been appointed sales manager of Rubatex Division, Great American Industries, Inc., 230 Park Ave., New York, N. Y.

Eugene McCauliff has been elected vice president in charge of sales of the Glyco Products Co., Inc., Brooklyn, N. Y. He has been in charge of technical service and development since 1944. Previously Dr. McCauliff was connected with the Hooker Electrochemical Co. and Industrial Synthetics Corp.

Edward Rosendahl, executive vice president of Glyco Products, has been elected a director of the Brooklyn Chamber of Commerce.

Donald R. Caskie has been appointed assistant treasurer of the Firestone Tire & Rubber Co. of Canada, Ltd., Hamilton, Ont. During his service with Firestone, Mr. Caskie has held a number of important positions in the treasury department.

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THE WORLD'S LEADING PRODUCER OF FATTY ACIDS

Harding Miller has joined George Woloch Co., 61 Broadway, New York 6, N. Y., to handle scrap rubber and plastic material in the territory embracing Ohio, Michigan, Illinois, Indiana, Pennsylvania, and Canada. For the past 12 years Mr. Miller was with A. Schulman, Inc.

Aaron Coutts, 27, president of the Rubber Corp. of California, Garden Grove, Calif., has been elected a member of the Young Presidents' Organization, with national headquarters in the Prince George Hotel, New York, N. Y.

Bruce M. Bare has been appointed sales manager of the organic chemicals division, Dewey & Almy Chemical Co., Cambridge, Mass. Among the division's products are copolymer resins and latices for the rubber and paint industries, polyvinyl acetate for the textile and paint fields, and a series of dispersing agents for the chemical industry in general. With the completion, some time this summer, of new and enlarged manufacturing facilities at the Acton, Mass., plant there will be added a line of plasticizers and vinyl resins as well as increased production facilities for the company's copolymer resins. Mr. Bare previously had been district sales manager for Sharples Chemicals, Inc., Chicago, Ill., where he worked with sales and development of chemicals used in the manufacture of industrial coatings, synthetic resins, pharmaceuticals, detergents, demulsifiers, and other products related to the organic chemicals industry. With Sharples since 1948, including leave of absence for duty with the U. S. Army Chemical Corps, he previously had been with E. I. du Pont de Nemours, Inc., where he did research on lacquers and lacquer solvents.

D. T. Barber, manager of the audit department, Goodyear Tire & Rubber Co. of Canada, Ltd., New Toronto, Ont., has been elected president of the Toronto Chapter of the Institute of Internal Auditors for the year 1951-52.

Richard L. Marion has been named chemist of The Sun Rubber Co., Barberton, O., manufacturer of rubber toys and playthings. A specialist in the application of chemistry to industrial production, Marion will be primarily concerned with coordinating the work of Sun's laboratory with manufacturing operations in the development of new processes and improvement of existing techniques. This specialized work represents another step in Sun's program of expansion and product development. Marion comes to Sun from Fenn College in Cleveland, where he served as instructor in chemical engineering for the past four years. His background also includes two years as senior research engineer with the National Aniline Division of Allied Chemical & Dye Corp., Buffalo, N. Y. He is the son of Louis F. Marion, a pioneer in Sun's development and an administrative leader with the company for almost 25 years until his death in 1948.

Wm. Rand, treasurer and general manager of Tingley-Reliance Rubber Corp., Rahway, N. J., has been elected a vice president of the recently formed Rahway Industrial Association.

Allen H. Ottman, vice president and controller of the American Hard Rubber Co., New York, N. Y., has been elected president of the New York Chapter of the National Association of Cost Accountants. A member of the NACA since 1935, Mr. Ottman is also secretary of the New York Control of the Controllers Institute of America and treasurer of the National Management Council.

OBITUARY

Bartholomew J. Barry

DEATH came suddenly on June 5 to Bartholomew J. Barry at his summer home in Rumson, N. J. He resided at 740 Park Ave., New York, N. Y., in which city a Requiem Mass was sung at St. Patrick's Cathedral on June 7. Private interment followed.

Mr. Barry was a partner in the textile firm of Curran & Barry, 320 Broadway, New York, since the turn of the century and was also active in the management of several southern cotton mills. He was president and treasurer of W. A. Handley Mfg. Co., Roanoke, Ala., and treasurer of Massapoag Mills, Corp., Lincolnton, N. C.

Besides he was a member of the Merchants and New York Yacht clubs, the American Newcomen, American Irish Historical Societies, and Knights of Malta; a governor of the Rumson Country and Seabright Beach clubs; and a director of the Grand Jury Association of New York County.

Survivors include the widow and two daughters.

Alexander Smith

AFTER a prolonged illness Alexander Smith, since 1947 assistant chief engineer of Farrel-Birmingham Co., Inc., Ansonia, Conn., died recently in his home at Ansonia. He was with the company 26 years and had also served on its operating and patent committees.

Mr. Smith was born in Aberdeenshire, Scotland, in 1893. Completion of his engineering apprenticeship there was followed directly by service in the British Navy from 1914 to 1919. Until he came to America in 1925, he had worked as draftsman and engineer for leading Scottish engineering firms.

Everett W. Howe

EVERETT W. HOWE, plant engineer at the Providence, R. I., plant of United States Rubber Co., died suddenly at his home in Cranston, R. I., on May 24 after a brief illness. Funeral services were held in the Remington Funeral Parlors, Cranston, May 28, followed by burial in South Berlin, Mass.

Mr. Howe was born on May 17, 1900, in South Berlin, where he attended local schools. He was graduated from Massachusetts Institute of Technology in 1922, with a degree in mechanical engineering.

After employment at various engineering firms in the New England area, Mr. Howe joined U. S. Rubber at Providence in 1934 as a power engineer. He became plant engineer in 1939.

Mr. Howe belonged to the American Society of Mechanical Engineers, the Providence Engineering Society, the Alumni Association of MIT, the Turks Head Club, and the Edgewood Congregational Church.

He is survived by his wife, a daughter, and a son.

Estimated Automotive Pneumatic Casings and Tube Shipments, Production, Inventory — April, March, 1951; First Four Months, 1951-1950

	April, 1951	% of Change from Preceding Month	March, 1951	First Four Months, 1951	First Four Months, 1950
Passenger Casings					
Shipments					
Original equipment	2,279,850		3,124,715	10,598,437	10,767,927
Replacement	2,559,893		2,605,050	10,546,608	11,275,634
Export	33,098		53,820	187,820	180,803
Total	4,872,841	−15.75	5,783,585	21,332,865	22,224,364
Production	5,108,248	− 3.59	5,298,387	20,537,711	23,906,342
Inventory end of month	2,254,915	+ 9.73	2,055,015	2,254,915	10,349,395
Truck and Bus Casings					
Shipments					
Original equipment	521,326		494,964	1,860,916	1,373,889
Replacement	807,586		887,602	3,181,989	2,508,598
Export	54,867		68,825	251,409	271,426
Total	1,383,779	− 4.66	1,451,391	5,294,314	4,153,913
Production	1,431,880	+ 2.64	1,394,993	5,346,890	4,448,444
Inventory end of month	791,736	+ 5.76	748,599	791,736	1,988,595
Total Automotive Casings					
Shipments					
Original equipment	2,801,176		3,619,679	12,459,353	12,141,816
Replacement	3,367,479		3,492,652	13,728,597	13,784,232
Export	87,965		122,645	439,229	452,229
Total	6,256,620	−13.52	7,234,976	26,627,179	26,378,277
Production	6,540,128	− 2.29	6,693,380	25,884,601	28,354,786
Inventory end of month	3,046,651	+ 8.67	2,803,614	3,046,651	12,337,990
Passenger and Truck and Bus Tubes					
Shipments					
Original equipment	2,757,532		3,624,165	12,422,150	12,139,534
Replacement	2,786,958		2,896,062	12,010,667	10,604,562
Export	48,093		73,131	258,157	243,151
Total	5,592,583	−15.18	6,593,358	24,690,974	22,987,247
Production	5,565,700	− 4.50	5,827,593	22,487,801	23,864,173
Inventory end of month	4,656,998	+ 1.36	4,594,538	4,656,998	11,710,259

NOTE: Cumulative data on this report include adjustments made in prior months.
SOURCE: The Rubber Manufacturers Association, Inc., New York, N. Y.

THE STORY BEHIND THE WORD...



JADE...

The early Spanish explorers who discovered Jade in America called it "piedra de ijada" or "stone of the side." For they thought it had powers to cure the colic or pain in the side. The French borrowed the word, changing it to le jade. *The English took the last half of this and hence our American word for the stone discovered in America is "jade."*

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U. S. Imports, Exports, and Reexports of Crude and Manufactured Rubber

Exports of Domestic Merchandise

	March, 1951 Quantity	Value
UNMANUFACTURED, Lbs.		
Chicle and chewing gum bases	458,354	$194,094
Balata	5,240	8,590
Synthetic rubbers		
GR-S types	36,903	18,089
Neoprene	967,673	388,919
Nitrile types	171,120	87,331
"Thiokol"	6,000	3,705
Polyisobutylene	2,119	998
Other, except butyl	9,534	2,900
Reclaimed rubber	3,304,298	318,061
Scrap rubber	4,978,090	359,942
TOTALS	9,939,331	$1,382,629
MANUFACTURED		
Rubber cement, gals.	92,973	$177,778
Rubberized fabric		
Auto cloth, sq. yds.	11,323	19,150
Piece goods and hospital sheeting, sq. yds.	97,889	81,936
Rubber footwear		
Boots, prs.	8,905	39,856
Shoes, prs.	7,482	22,556
Rubber-soled canvas shoes, prs.	9,053	21,356
Soles, doz. prs.	94,819	64,495
Heels, doz. prs.	66,514	72,627
Soling and toplift sheets, lbs.	194,926	53,965
Gloves and mittens, doz. prs.	14,682	69,242
Drug sundries: water bottles and syringes, no.	37,063	28,340
Other	.....	278,028
And rubberized clothing	.....	222,577
Toy and novelty balloons	.....	20,179
Toys and Balls	.....	47,274
Erasers, except pencil, lbs.	36,400	31,073
Hard rubber products		
Battery boxes, no.	33,362	65,694
Other electrical goods, lbs.	264,442	108,737
Combs, finished, doz.	3,658	3,837
All other goods	.....	15,988
Tires and casings		
Truck and bus, no.	74,972	3,941,987
Auto, no.	44,565	717,739
Aircraft	.....	73,459
Farm tractor, etc., no.	3,575	159,420
Other off-the-road, no.	6,654	871,392
Bicycle, no.	8,252	13,587
Motorcycle, no.	476	4,551
Other, no.	1,382	39,348
Inner tubes: auto, no.	23,338	51,231
Truck and bus, no.	34,537	159,788
Aircraft, no.	677	5,124
Other, no.	5,022	24,576
Solid tires: truck and industrial, no.	1,708	37,041
Tire repair materials		
Camelback, lbs.	282,466	92,804
Other, lbs.	345,080	328,758
Rubber and friction tape, lbs.	54,351	47,055
Belting:		
Auto, home, lbs.	130,298	154,293
Transmission: V-belts, lbs.	140,324	301,034
Flat belts, lbs.	43,322	81,481
Other, lbs.	23,361	34,474
Conveyer and levitator, lbs.	133,233	114,981
Other, lbs.	205	950
Hose and tubing, lbs.	612,970	520,850
Packing, lbs.	189,417	225,978
Mats, flooring, tiling, lbs.	538,708	154,692
Thread: bare, lbs.	17,537	45,713
Textile covered, lbs.	28,398	101,838
Gutta percha manufactures, lbs.	863	1,076
Compounded latex and rubber for further manufacture, lbs.	910,990	382,862
Other natural and synthetic rubber manufactures	.....	683,808
TOTALS	.....	$10,816,578
GRAND TOTALS, ALL RUBBER EXPORTS	.....	$12,199,207

Imports for Consumption of Crude and Manufactured Rubber

	March, 1951 Quantity	Value
UNMANUFACTURED, Lbs.		
Crude rubber	124,484,776	$63,104,361
Latex	16,530,047	11,140,554
Crude chicle	439,904	254,882
Guayule	224,000	100,048
Balata	66,211	22,838
Jelutong or Pontianak	430,801	222,934
Gutta percha	73,988	65,143
Synthetic rubber	2,580,573	651,974
Reclaimed rubber	448,000	50,610
Scrap rubber	5,593,426	308,529
TOTALS	150,871,726	$75,921,873
MANUFACTURED		
Tires and casings		
Auto, etc., no.	5,848	$231,706
Bicycle, no.	9,716	10,647
Other, no.	24	6
Inner tubes: auto, etc. no.	4,527	20,001
Rubber footwear		
Boots, prs.	6,063	25,861
Shoes and overshoes prs.	9,196	5,252
Rubber-soled canvas shoes, prs.	4,735	5,049
Athletic balls: golf, no.	161,812	41,473
Tennis, no.	81,984	22,086
Other, no.	378,576	46,196
Rubber toys, except balloons	.....	27,869
Hard rubber goods		
Combs, no.	106,762	10,32[2]
Other	.....	44,504
Rubberized printing blankets, lbs.	1,017	4,144
Rubber and cotton packing, lbs.	3,233	4,564
Gaskets and valve packing	.....	674
Belting, lbs.	1,155	4,405
Hose and tubing	.....	16,854
Drug sundries	.....	8,542
Nipples and pacifiers, gross	2,250	3,571
Other rubber products	.....	1,627
Gutta percha manufactures, lbs.	975	771
Rubber bands, lbs.	36,005	24,589
Synthetic rubber goods	.....	160
Other soft rubber goods	.....	146,066
TOTALS	.....	$708,940
GRAND TOTALS, ALL RUBBER IMPORTS	.....	$76,630,813

Reexports of Foreign Merchandise

	March, 1951 Quantity	Value
UNMANUFACTURED, Lbs.		
Crude rubber	721,674	$449,703
Balata	16,090	16,360
Jelutong, gutta percha, and similar gums	1,210	3,713
Scrap rubber	72,264	6,218
TOTALS	811,238	$475,994
MANUFACTURED		
Piece goods and hospital sheeting, sq. yds.	136	$690
Drug sundries, except syringes and hot water bottles	.....	725
Rubber balloons	.....	378
Toys and balls	.....	3,932
Erasers, lbs.	350	127
Other natural and synthetic rubber manufactures	.....	1,314
TOTALS	.....	$7,166
GRAND TOTALS, ALL RUBBER REEXPORTS	.....	$473,160

SOURCE: Bureau of Census, United States Department of Commerce, Washington, D. C.

Dividends Declared

COMPANY	STOCK	RATE	PAYABLE	STOCK OF RECORD
American Hard Rubber	Com.	$0.25 extra	June 30	June 19
		0.50	June 30	June 19
	Pfd.	1.75 q.	June 30	June 19
Armstrong Rubber Co.	Com. A & B	0.50	July 2	June 14
	4¾% Pfd.	0.59⅜ q.	July 2	June 14
Canada Wire & Cable Co., Ltd.	A	1.00 q.	June 15	May 31
	B	0.75 q.	June 15	May 31
Dayton Rubber Co.	Com.	0.45	July 25	July 10
Denman Tire & Rubber Co.	Com.	0.10	June 29	June 20
	Pfd.	0.12½ q.	June 29	June 20
Dunlop Rubber Co., Ltd.	A. D. R.	2½% extra	July 10	May 22
	A. D. R.	15%	July 10	May 22
	5% 1st Pfd.	0.62½ s.	June 30	June 14
General Cable Corp.	Com.	0.15	July 2	June 22
	Pfd.	1.00 q.	July 2	June 22
	2nd Pfd.	0.50 q.	July 2	June 22
General Tire & Rubber Co.	4½% Pfd.	1.06¼ q.	June 29	June 19
	3¾% Pfd.	0.93¾ q.	June 29	June 19
	3¼% Pfd.	0.81¼ q.	June 29	June 19
B. F. Goodrich Co.	Com.	0.50	June 30	June 7
	Cum. Pfd.	1.25 q.	June 30	June 7
Goodyear Tire & Rubber of Canada, Ltd.	Com.	1.00	June 30	June 11
I. B. Kleinert Rubber Co.	Com.	0.25 q.	June 12	May 29
Midwest Rubber Reclaiming Co.	Com.	0.25 q.	July 1	June 11
	4½% Pfd.	0.56¼ q.	July 1	June 11
Mohawk Rubber Co.	Com.	0.25 extra	June 30	June 15
		0.25 q.	June 30	June 15
Monroe Auto Equipment Co.	Com.	0.30	June 28	June 13
	5% Cum Pfd.	0.62½ q.	July 1	June 13
O'Sullivan Rubber Corp.	5% Pfd.	0.25 ac.	July 1	June 15
		0.25	July 1	June 15
Raybestos-Manhattan, Inc.	Com.	0.50	June 12	May 28
Rome Cable Corp.	Com.	0.25	July 2	June 11
	Pfd.	0.30 q.	July 2	June 11
A. G. Spalding & Bros., Inc.	Com.	0.25 q.	June 15	June 8
Thermoid Co.	Com.	0.11 q. incr.	June 11	May 3

FINANCIAL

Johnson & Johnson, New Brunswick, N. J. March quarter, 1951: net income, $3,324,000, equal to $1.57 each on 2,089,493 shares, compared with $3,092,000, or $1.51 each on 1,988,025 shares in the 1950 quarter; net sales, $53,457,000, against $37,731,000.

Rome Cable Corp., Rome, N. Y. Year ended March 31: net profit, $1,922,136, equal to $4.56 each on 406,638 common shares, contrasted with $302,209, or 61¢ each on 382,3000 shares, in the preceding fiscal year; net sales, $35,142,901, against $19,602,984; income taxes, $2,255,000, against $196,000.

Thermoid Co., Trenton, N. J. January-March, 1951: net income, $450,000, equal to 52¢ a share against $270,847, or 31¢ a share in the 1950 quarter.

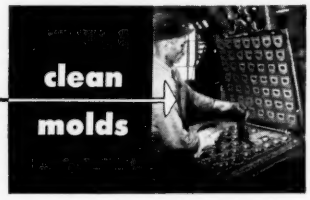
Viceroy Mfg. Co., Ltd., Toronto, Ont., Canada. Year ended February 28, 1951: net profit, $244,569, equal to $2.03 a common share, against $177,340, or $1.50 a share, in the preceding fiscal year.



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FAR EAST

MALAYA

New records were established in Malaya's rubber industry in 1950: total production at 705,250 long tons topped both the 1949 output at 670,257 tons and the previous high of 696,978 tons in 1948. Exports, which for the first time exceeded the one-million-ton mark, reached the high of 1,106,483 tons; while imports were 448,656 tons, against 220,141 tons in 1949. The previous high for imports had been 313,549 tons in 1947.

A breakdown of the production figures for 1950 shows that these included 73,616 tons of latex (against 44,763 tons in 1949), 250,778 tons of remilled rubber, and 8,610 tons of special rubber. Among the latter were 1,032 tons of softened rubber and 63 tons of chemically modified rubber.

Estates accounted for 376,750 tons of the total output, against 401,000 tons in the preceding year; smallholders increased their share from 271,000 tons in 1949 to 328,250 tons last year.

According to data supplied by the Registrar of Statistics, average yields per tapped acre of ordinary rubber came to 432 pounds over the first 11 months of 1950; for high-yielding trees the average was 818 pounds per acre. About 22% of the area tapped is planted with modern high-yielding trees.

The greater part of the imports of crude rubber came from Indonesia, which sent 361,587 out of the total 448,656 tons.

The chief destinations of the exports, which included 73,202 tons of latex, follow:

	1950	1949
United States ..... *tons*	376,724	265,328
United Kingdom	197,577	164,362
France	60,550	57,591
Germany	52,735	56,738
Italy	40,673	33,491
Russia	68,058	63,414
Australia	33,321	22,655
Canada	37,962	32,444
China	38,568	6,999
Hong Kong	44,367	23,288
Japan	39,766	25,897
Union of South Africa	21,783	18,865

The chief consumers of latex were:

	1950	1949
United States ..... *tons*	39,420	23,951
United Kingdom	17,472	12,929
France	3,673	1,741
Germany	4,275	1,481
Italy	1,505	934
Australia	1,921	739
Japan	1,117	511
Union of South Africa	437	434

These amounts are included in the total rubber shipments from Malaya.

It will be observed that all the countries listed except Germany



Keep Cool
SEE PAGE 394

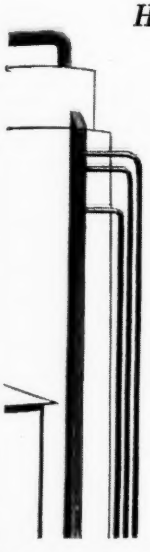
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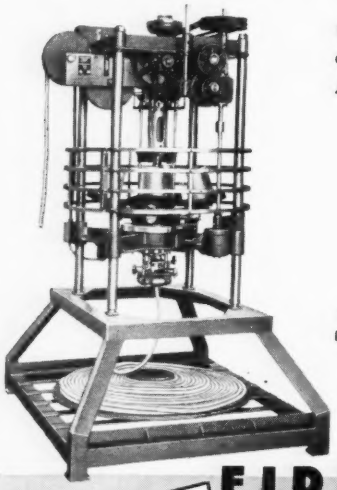
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took more rubber in 1950 than in 1949; the substantial increases in exports to China and Hong Kong are especially notable. At the same time, shipments to the smaller European consumers were in most cases below those of 1949. Greece is one of the more striking exceptions, taking 1,016 tons in 1950, against 54 tons in 1949. Czechoslovakia took 8,460 tons in 1950, against 4,641 tons the year before.

According to figures supplied by the Secretary of State for the Colonies in the House of Commons on January 24, 1951, total Malayan rubber exports in the years 1964-1949 were as follows:

	Exports		Reexports	
	Tons	Value	Tons	Value
1946	558,001	£57,730,719	187,290	£15,032,628
1947	953,303	91,125,011	313,700	20,944,201
1948	979,115	101,769,936	300,471	20,070,420
1949	899,211	84,804,568	155,952	14,422,640

The Malayan Federation reports natural rubber consumption of 4,972 tons in 1950, including 277 tons destroyed by fire; Singapore consumption for the first 11 months of the year was 12,211 tons, including 8,443 tons destroyed by fire.

Rubber stocks in the Federation and Singapore totaled 136,581 tons on December 31, 1950, as compared with 123,320 tons at the end of 1949.

INDONESIA

In the early months of 1950 insecurity in planting areas in Java was said to have increased. More than 30 rubber estates are reported to have suffered losses due to illegal tapping; 21 estate managers and workers were killed in attacks by armed bandits; several estates in West and Central Java were illegally occupied or managed, and a number of estates, chiefly in West Java, had to be abandoned because of inadequate protection.

The government is doing what it can to restore order and suppress these depredations. Certain measures adopted since the beginning of the year may, by holding out the prospect of improved economic and labor conditions for the masses, also aid in the difficult task of curbing lawlessness, by making order seem more attractive.

On January 8, 1951, new uniform labor regulations and workers' compensation laws went into effect. These laws will apply throughout the Indonesian Republic; they are largely along modern lines, providing for a 40-hour week, with time and half for overtime and suitable compensation in case of accidents and consequent disability or death.

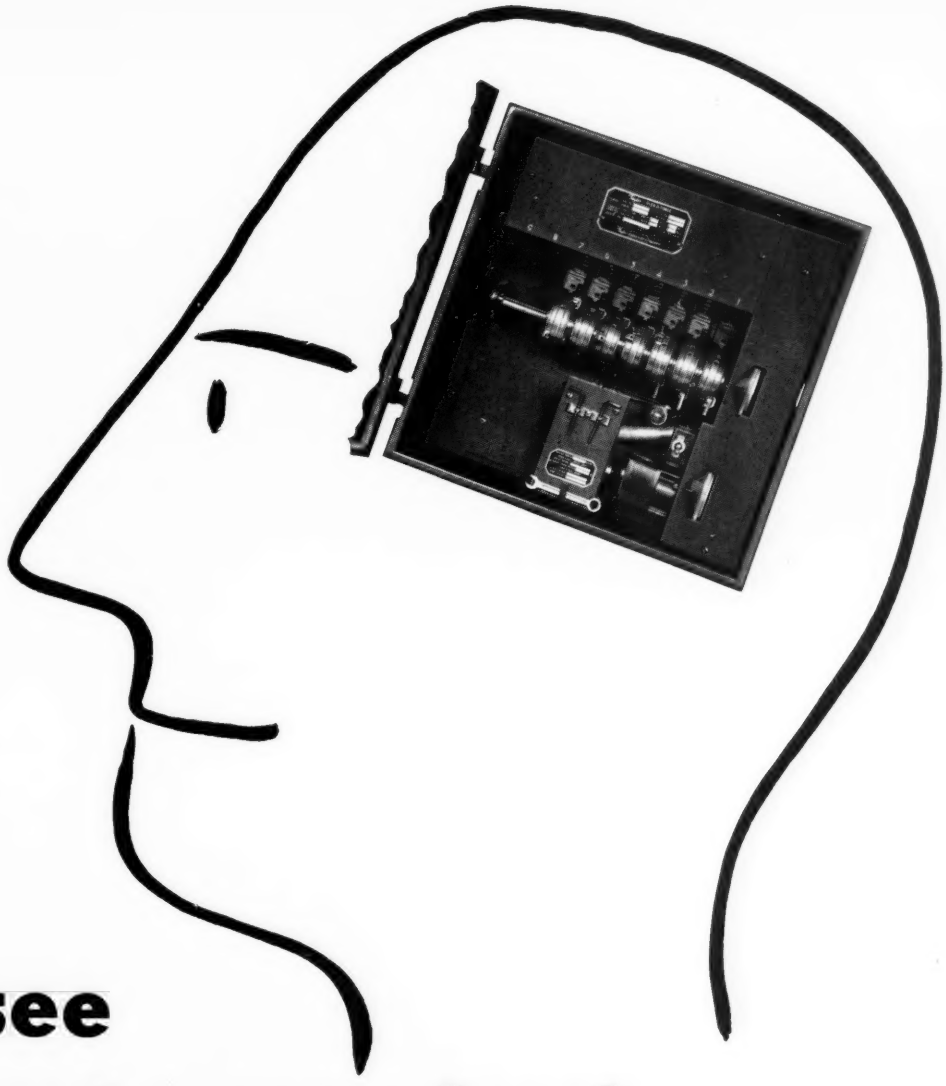
In February a decree was issued banning all strikes and lockouts in a number of important industries including transportation, harbor work, rubber and plantation industries. The fact that workers on struck estates returned to their jobs, and a scheduled nation-wide oil strike was postponed while negotiations aiming at the settlement of differences were being conducted, encourages the belief here in the government's ability to enforce the ban.

In a further attempt to solve labor problems the government called a conference on February 8 in Bandung, Java, of the Employment Services, which representatives of labor and employers attended. The spokesman for the employers pointed to the need of regulated migration of labor from areas where a surplus existed to those where there was a shortage. He stated that estates in East Coast Sumatra, for instance, were in need of about 40,000 more workers; Atjeh was short some 20,000 workers, and in other parts of Sumatra and Borneo there were similar shortages of labor. At the same time there was a considerable surplus in the sugar and petroleum industries. There is also a great need of trained workers and higher echelon staff.

Attention has been called to an example of what is regarded by some as foreshadowing a new government policy. It seems that recently the government returned six Java estates to their former owners, but first reserved certain cultivated areas for distribution among native farmers. All undeveloped estate land was returned, but only on condition that it should be put to suitable use within six months; otherwise it is to revert to the government for other disposition.

Plans seem to be afoot for establishing an insulated wire and cable factory in Java. Rumor has it that the Hollandsche Draad en Kabelfabriek is to set up a subsidiary here and that the Indonesian Government has underwritten 51% of the capital, thus securing a controlling interest in the new undertaking.

Since the independence of Indonesia, a problem has presented



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itself, namely, how best to form an Indonesian staff capable of taking up within the shortest possible time higher positions on estates. European employers have shown a commendable willingness to cooperate toward this end, although there is in some quarters a dubious feeling as to whether Indonesians would be ready to identify themselves with the interests of the owners, and it is recalled that during a strike that took place not long ago, the Indonesian executives sided with the strikers against the employers. Apparently the majority opinion inclines to be optimistic, for it is noted in a recent issue of the *Bergcultures*[1] that an intensive training course to fit Indonesians for leading positions on estates in the hill country was officially opened on November 21, 1950, in the building of the Experiment Station of the General Association of Experiments Stations, at Bogor, Java.

[1] Dec. 1, 1950.

JAPAN

Interest in the production of synthetic resins is reviving here, and various types of resins and plastics are being made, including, besides celluloid and vinyl acetate, substantial amounts of urea and phenolic resins, as well as a certain amount of vinyl chloride resins and small quantities of glyptal, methacrylate, and polyamid resins. In December, 1950, 2,680 metric tons of these materials were produced, 300 tons more than in the month before.

The Japanese rubber manufacturing industry is said to have a capacity for processing about 10,000 metric tons of crude rubber a month, but the difficulty of obtaining foreign currency restricted activities. Nevertheless until the steep rise in rubber prices, consumption had been increasing to about 6,000 tons a month.

Figures for the first nine months of 1950 show an increase of more than 100% in production of tires and tubes of all kinds, that is, from 6,366,000 tires and 6,524,400 tubes in 1949 to 13,171,500 tires and 13,549,700 tubes for the 1950 period indicated. Cycle tires and tubes represented more than 90% of the respective totals. Only truck tires declined in output, following the trend noted practically since the beginning of 1950, with totals for the first three quarters of that year at 319,400 units, against 482,000 units for all of 1949. It seems likely that 1950 figures for heavy-duty tires will be even below the 369,600 units for 1948.

Production of rubber footwear was 60,575,500 pairs in the first nine months of 1950, against 41,484,500 pairs in 1949, including in 1950, 26,881,700 pairs of rubber-soled canvas shoes, 11,268,000 pairs rubber boots and shoes, and 22,425,800 pairs rubber-soled socks. The increase in the 1950 period was almost wholly due to higher outputs of the first two types of footwear.

Nippon Rubber Co., Ltd., is now located at 22 2-chome, Uchisaiwai-cho, Chiyoda-ku, Tokyo.

CEYLON

Ceylon could also point to record rubber production in 1950, 113,500 tons, 8,000 tons above the record of 1943. Output in 1949 was 89,500 tons. Of the 1950 total 28,000 tons came from smallholdings of less than 10 acres each. Local consumption of rubber increased slightly from 139 tons in 1949 to 156 tons in 1950.

Various rumors have for some months been going the rounds regarding a new venture in Ceylon by Dunlop Rubber Co., Ltd., which, according to some reports, eventually also involved the manufacture of different kinds of rubber goods. Whatever Dunlop's future plans in Ceylon may embrace, reliable sources indicate that at present the company will prepare latex for export. A subsidiary, the Latex Corp. of Ceylon, Ltd., has been formed with an authorized capital of 4,000,000 rupees, and a factory is to be erected at Kalutara, an important rubber-planting district near Colombo; it is expected to commence preparing concentrated latex within the next three or four months. The corporation proposes to buy up field latex from nearby rubber growers under contracts for various periods and is said to have promised suppliers 50% of the net profits.

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Editor's Book Table

NEW PUBLICATIONS

"Witco M. R. (Hard Hydrocarbon) in Natural and Chemical Rubbers." Witco Chemical Co., 295 Madison Ave., New York 17, N. Y. 52 pages. Extensive technical data are presented on the properties of Witco M. R. #38 and its use in natural rubber and GR-S compounds, including tire tread stocks, smooth tubing channel compounds, molded slab shoe sole stocks, wire and cable insulation, garden hose, and others. A section on mixing and testing procedures is also included.

"Electrical Properties of Pliolite S-6B." Techni-Guide #PR-600-5. Goodyear Tire & Rubber Co., Inc., Akron 16, O. 2 pages. Data are given on the specific volume resistivity, dielectric constant, power factor, and loss factor of Pliolite S-6B, an easy processing counterpart of Pliolite S-6 for use in wire and cable insulation.

"U. S. Rubber Laytex Telephone Cables." United States Rubber Co., Rockefeller Center, New York 20, N. Y. 16 pages. This catalog covers specifications and engineering properties of the company's latex insulated telephone cables. A description is included of Uscolite plastic splice housings which eliminate the hand-taped splice.

"Thixon Bonding Agents." Harwick Standard Chemical Co., Akron, O. 4 pages. General information appears on the uses and application methods of the six types of Thixon bonding agents for adhesion of natural and synthetic rubbers to most metals, including brass and steel. It is emphasized that the Thixons can be tailor-made to meet individual requirements.

"Mastic Flooring Underlayments." Flintkote Co., Inc., 30 Rockefeller Plaza, New York 20, N. Y. 4 pages. This illustrated bulletin describes the company's mastic underlayments for asphalt and rubber floorings and gives detailed instructions as recommended practice in application of the underlayments.

"Consulting Services." Thirteenth Edition, 1951. Association of Consulting Chemists & Chemical Engineers, Inc., 50 E. 41st St., New York 17, N. Y. 136 pages. This revised and enlarged edition provides complete listings of member consultants, with information on their organizations, staffs, and scope of services. A classified list of consulting services is included, together with alphabetical and geographic indices of members.



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SEE PAGE 394

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"Bakelite Polyethylene for Paper Coatings—Properties and Coating Methods." Bakelite Co., Division of Union Carbide & Carbon Corp., 300 Madison Ave., New York 17, N. Y. 30 pages. This booklet describes the manufacture, properties, and applications of polyethylene coated paper. Technical data cover the properties of polyethylene film, and detailed descriptions of the various coating methods are included. Special attention is given to the extrusion-lamination process for coating paper, based on extensive tests made by the company.

Publications of E. I. du Pont de Nemours & Co., Inc., Wilmington 98, Del.

"Bonding Elastomers to Metal with MDI-50." BL-241, April 30, 1951. 12 pages. Extensive data are given on the preferred method for bonding metal to natural, nitrile, or neoprene rubbers by use of MDI-50. The variables which affect adhesion of such bonded stocks are discussed in detail.

"Heel and Sole Compounding." C. E. McCormack and R. S. Graff. Report No. 51-3, April, 1951. 40 pages. This report offers complete information on the formulation and compounding of conventional natural rubber and GR-S heels and soles, premium neoprene heels and soles, and both natural rubber and neoprene crepe soles.

"Neoprene Notebook." No. 48, April, 1951. 12 pages. This issue of the "Notebook" contains part one of an article on "Low Temperature Testing of Elastomers" and stories on the use of neoprene in trolley-car fenders, magnetic sweepers, underground cables, blimps, glass panel seals, and conveyers.

"'Hypalon' S-2 Chlorosulfonated Polythene." New Product Bulletin No. XX-7. 24 pages. Preliminary data in this bulletin deal with the raw forms, vulcanizate properties, compounding, and processing of "Hypalon" S-2, an elastomeric ethylenic polymer which can be processed and cured in conventional rubber machinery. The polymer does not require carbon black to achieve maximum physical properties and does not require breaking down before compounding. Vulcanizates are flexible without plasticizers; have outstanding resistance to ozone and abrasion; have excellent resistance to sunlight, weather, flexing, and oxygen; have low water absorption; and have good resistance to heat, good low-temperature properties, and good electrical properties.

"Accepted General Specification for Latex Foam Rubber Articles." March, 1951. British Latex Foam Manufacturers' Association, Royal Exchange, Cross St., Manchester 2, England. 11 pages. This specification on latex foam products, adopted by the Association, is divided into three parts: (1) tests and specifications on the whole product, including appearance, dimensions, hardness, compression set, and solutioned joints; (2) specifications for accessory items, including tacking strips; and (3) tests and specifications on the intrinsic properties of the foam, including tensile tests, accelerated aging, and copper content. Appendices cover hardness and copper content tests in detail.

"Aging Characteristics of Electrical Insulation." Report PB-102619. Office of Technical Services, United States Department of Commerce, Washington 25, D. C. 13 pages. Price, 50¢. (Orders should be accompanied by check or money order payable to the Treasurer of the United States.) This report gives details of a new procedure, developed at the Naval Research Laboratory, for testing the aging characteristics of electrical insulation. The procedure uses coils wound and subjected to stresses experienced by motor windings, in order to duplicate the physical factors which, together with temperature, influence the aging of insulations.

"Rubatex Closed Cell Rubber." Catalog No. RBS-4-51. Great American Industries, Inc., Bedford, Va. 10 pages. This revised catalog describes and illustrates the manufacture, structure, and applications of Rubatex cellular rubber. The catalog features a comprehensive chart listing physical and chemical properties of the 18 grades, including natural rubber, neoprene, GR-S, and nitrile rubber stocks. A panel of actual samples of 12 types of Rubatex stocks is also available.

"Triton Surface-Active Agents." Rohm & Haas Co., Washington Sq., Philadelphia 5, Pa. 46 pages. Complete information appears on the nature and properties of the 12 Triton and Hyamine surface-active agents made by the company. Applications for the materials are described, including use in rubber and latex. Included also is an unbound reference chart listing the chemical structure, recommended solvent, ionic activity, methods of use, and applications of each material.

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LONDON

THE RUBBER INDUSTRY owes its development largely to scientific and technical research and the Institution was founded in 1921 to foster scientific and technical advancement and to disseminate the results.

THE INSTITUTION TODAY is the centre of a great fraternity of rubber manufacturers, scientists, technologists, research establishments, executives and students from every country whose object is the advancement of the cause of the rubber industry throughout the world.

OBJECTS: To promote corporate and concerted effort in the industry by bringing together all those engaged or interested in the various branches of science and technology on which the Industry is based and co-ordinating their respective contributions.

To promote the profession and practice of Rubber Technology.

To encourage the extension of scientific and technical education in the principles and details of rubber manufacture.

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BIBLIOGRAPHY

Processes of Phenol-Resin Hardening and Some Views. XIII. K. Hultzsch, *Kunststoffe*, 38, 4, 65 (1948).

Optical Process for Testing Surface Quality. *Kunststoffe*, 38, 4, 74 (1948).

Synthetic Resin Adhesives and Their Application. H. Saechtling, K.-H. Mielke, *Kunststoffe*, 38, 5/6, 85 (1948).

Determination of Usefulness of Synthetic Adhesives by Viscosity Measurements. W. Kuch, *Kunststoffe*, 38, 5/6, 95 (1948).

New Method for Determining the Degree of Hardness of Hardenable Molding Materials. K. H. Hauck, *Kunststoffe*, 38, 5/6, 99 (1948).

Silicone Rubber (Silastic) for Vacuum-Tight Joints Heated to Temperatures up to 200°. H. Gondet, *Le Vide*, 4, 676 (1949).

Aging of GR-S Vulcanizates. III-IV. J. R. Scott, *J. Rubber Research*, 18, 117 (1949).

Processes for Rubber Reclaiming. W. Esch, *Seifen-Öle-Fette-Wachse*, 75, 189 (1949).

Action of Quinones and Peroxides on Styrene. J. W. Breitenbach, W. Schulz, *Monatsh.*, 80, 463 (1949).

Modern Developments in Pneumatic Tires. S. Hull, *India Rubber J.*, Feb. 4, 1950, p. 4; Feb. 11, p. 5.

Analytical Characterization of Alkyd Resins. N. W. Hanson, *Paint, Oil, Chem. Rev.*, Feb. 16, 1950, p. 16.

Adhesiveness of Rubber Cements. W. Späth, *Gummi u. Asbest*, 3, 59, 88 (1950).

Natural and Synthetic Rubbers. N. Bekkedahl, *Anal. Chem.*, Feb., 1950, p. 253.

Hysteresis Determinations with the Goodyear-Roelig Machine. C. S. Wilkinson, Jr., S. D. Gehman, *Anal. Chem.*, Feb., 1950, p. 283.

Equivalent Effects of Time and Temperature in the Shear Creep and Recovery of Elastomers. F. S. Conant, G. L. Hall, W. J. Lyons, *J. Applied Phys.*, 21, 499 (1950).

Rubbone. F. J. Popham, *Verfkronick*, 23, 156 (1950).

Preparation and Properties of a Hydroxlyated Polyamide. G. Beauvalet, *Ann. chim.*, 12, 5, 313 (1950).

Thermal Decomposition of Styrene-Butadiene Popcorn Polymer. J. Halpern, C. A. Winkler, *Can. J. Research*, 28B, 5 (1950).

Flow Behavior of Concentrated GR-S Rubber Solutions. A. B. Bestul, H. V. Belcher, *J. Colloid Sci.*, 5, 303 (1950).

Properties of Silicone Rubbers. R. C. W. Moakes, J. R. Pyne, *J. Rubber Research*, 19, 77 (1950).

Vulcanizing Behavior of Purified Rubber. H. P. Stevens, *India Rubber J.*, 119, 52 (1950).

Heating Rubber and Synthetic Materials by High Frequency. H. Kalpers, *Gummi u. Asbest*, 3, 118 (1950).

Automatic Control in the Rubber Industry. I. G. Zakarian, *Rev. gén. caoutchouc*, 26, 12, 791 (1949); 27, 3, 155 (1950).

Frantex B, Reinforcing Filler. R. Gauthier, *Rev. gén. caoutchouc*, 26, 12, 798 (1949); 27, 1, 35 (1950).



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MARKET REVIEWS

CRUDE RUBBER

TRADING in the primary foreign rubber markets was reported quiet from May 16 to June 15. United States buying price ideas were said to be slightly lower than quotations, and actual transactions were moderate. The government bought heavily during the period of declining prices late in April and early in May and was able to sit back and wait for further price drops. These further declines are expected when European buying in the Far East is exhausted, and producers' stocks begin to mount.

Factory buying of rubber from GSA for July use was reported light, with many users awaiting a reduction in the selling price, now 66¢ a pound for No. 1 smoked sheets. Purchases for July have been made with the price left open in anticipation of a reduction for July, August, and September delivery rubber. Trade observers believe that this reduction in the GSA selling price will amount to about 8¢ a pound, which will be enough to provide some relief to manufacturers, but not enough to require them to reduce price ceilings on their rubber products.

Latices

GOVERNMENT planners are apparently agreed that discontinuance of sole buying of *Hevea* latex by GSA and removal of all but a remote NPA supervisory control over consumption are now desirable to avoid dislocations within the industry; the questions of when and how these steps should be taken are as yet unanswered, according to Arthur Nolan, Latex & Rubber, Inc., writing in the June issue of *Natural Rubber News*. Such action is necessary in view of the fact that the latex stockpile objective has been achieved, storage space is limited, usage is declining at present prices, and severe economic stresses to the industry appear inevitable.

Conversion of production facilities from latex to dry rubber appears to have reached a maximum, and it is generally believed that no more solid rubber would be available for stockpiling if latex continues under tight controls. Latex decontrol might produce some difficulties in the case of competitive products made from both latex and dry rubber, but the total volume of such overlapping products is said to be less than 0.5% of total domestic rubber usage.

Because of GSA's policy of purchasing only enough latex to meet certain estimated requirements for stockpiling and consumption, a shortage of latex may develop late in the year after the relaxation of government controls. *Hevea* latex production has been cut back, and users' available supplies reduced by inventory restrictions; so a gap will appear before latex ordered on the open market can be delivered here.

The GSA selling price for tank carlots of concentrated *Hevea* latex remains at 84.5¢ a pound of solids, and just when the price will be lowered is a matter for conjecture. The world price for latex has been hovering between 60-65¢ a pound, and a reduction to approximately this level would do much to relieve the domestic industry's problems in maintaining facilities while operating at a loss.

RECLAIMED RUBBER

THE reclaimed rubber market picture showed no changes from the preceding month during the period from May 16 to June 15. Production and sales of reclaim continued at high levels, and the industry awaited the issuance of government ceiling price regulations reported imminent.

Final February and March and Preliminary April statistics on the domestic reclaimed rubber industry are now available. Final February figures give a production of 30,402 long tons; imports, 100 long tons; consumption, 28,792 long tons; exports, 1,629 long tons; and month-end stocks, 36,885 long tons. Final March figures follow: production, 35,094 long tons; imports, 200 long tons; consumption, 32,678 long tons; exports, 1,475 long tons; and month-end stocks, 38,334 long tons. Preliminary figures for April indicate a production of 33,180 long tons; consumption, 32,179 long tons; exports, 1,552 long tons; and month-end stocks, 38,450 long tons.

There were no changes in reclaimed rubber prices during the period, and current quotations follow:

Reclaimed Rubber Prices

	Sp. Gr.	¢ per Lb
Whole tire	1.18-1.20	10.00/10.75
Peel	1.18-1.20	nom.
Inner tube		
Black	1.20-1.22	nom.
Red	1.20-1.22	nom.
GR-S	1.18-1.20	nom.
Butyl	1.16-1.18	nom.

The above list includes those items or classes only that determine the price basis of all derivative reclaim grades. Every manufacturer produces a variety of special reclaims in each general group separately featuring characteristic properties of quality, workability, and gravity at special prices.

SCRAP RUBBER

AN EASIER undertone and declining activity featured the scrap rubber market during the period from May 16 to June 15. Reports circulated each week that the scrap rubber ceiling price regulation would be forthcoming during the next week, and this uncertainty had its effect on both the scrap dealers and reclaimers. In addition, the reclaimers were reported to have fairly comfortable inventory positions, and no longer were actively buying scrap.

The easier market was reflected by price declines for mixed auto tires, and both red and black tubes. While the currently quiet market is not expected to change radically upon issuance of ceiling regulations, it is believed that the order will bring some degree of stability to the market and end the present uncertainty.

The scrap rubber dealers' industry advisory committee informed NPA on June 1 that scrap rubber supplies are plentiful to meet requirements this year. The industry will come fairly close to meeting needs for all types of scrap tires. The committee was of the opinion that NPA estimates on scrap black and butyl tubes could be met, but there was some doubt as to the requirements for red tubes. NPA estimates on tire peeling requirements were said to be too high, but the industry thinks that it could come close to meeting 1951 needs for peelings if the price s reasonable.

Following are dealers' selling prices for scrap rubber, in carload lots, delivered to mills at the points indicated:

	Eastern Points (Per Net Ton)	Akron, O. (Per Net Ton)
Mixed auto tires	$32.00	$33.00
Peelings, No. 1	70.00	70.00
3	35.00	35.00
	(¢ per Lb.)	
Black inner tubes	10.50	10.50
Red passenger tubes	17.00	17.00

RAYON

WORLD output of rayon filament yarn and staple reached a new record total of 3,494,170,000 pounds in 1950, an increase of 29% over the 1949 figure and 25% greater than the previous high set in 1941. Rayon filament yarn production reached a new high during 1950 of 1,929,250,000 pounds, 18% above the previous record set in 1949. Potential capacity of the world's rayon industry is currently estimated at 4,324,000,000-pounds, and an operable annual capacity of 4,973,000,000 pounds is expected by the end of 1952.

Total domestic shipments of rayon by United States producers amounted to 110,300,000 pounds during May, an increase of 3% over the preceding month. Shipments of viscose high-tenacity yarn during the January-May period of this year totaled 131,300,000 pounds 7% above figures for the comparable 1950 period.

On May 17 the NPA amended its order M-15 by increasing from 15-30% the amount of high-tenacity rayon yarn production that manufacturers must set aside to fill defense-rated orders. The amendment was said to be designed to spread increased demands for the yarn among as many manufacturers as possible to prevent disrupting their production schedules.

No changes were made in rayon tire yarn and fabric prices during the period from May 16 to June 15, and current prices follow:

Rayon Prices

Tire Yarns

1100/480	$0.62/	0.63
1100/490		.62
1150/490		.62
1650/720	.61/	.62
1650/980		.61
1900/980		.61
2200/960		.61
2200/980		.60
4400/2934		.63

Tire Fabrics

1100/490/2		.72
1650/980/2	.695/	.73
2200/980/2		.685

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COTTON AND FABRICS

NEW YORK COTTON EXCHANGE
WEEK-END CLOSING PRICES

Futures	Apr. 28	May 19	May 26	June 2	June 9	June 16
July	45.26	45.32	45.08	44.88	44.28	44.55
Oct.	40.16	39.48	38.02	38.28	37.42	37.40
Dec.	39.69	38.98	37.67	37.83	37.14	37.20
Mar.	39.58	38.88	37.59	37.74	37.10	37.21
May	39.22	38.77	37.46	37.66	36.95	37.11
July	38.97	38.35	36.97	37.19	36.58	36.73

AN IRREGULAR decline featured the New York Cotton Exchange during the period from May 16 to June 15 in the face of lagging demand, a slow fabric market, and expectations of a large new crop. Some trade factors believe that the new crop may exceed the government goal of 16,000,000 bales by as much as 2,000,000 bales. Toward the end of the period a slight recovery took place after issuance on June 12 of interim export allocations of 2,500,000 bales for the first four months of the new season, starting August 1. This preliminary figure presages a total allocation of some 6,000,000 bales, as compared with expected exports this season of 4,200,000 bales.

The spot price for 15/16-inch middling cotton remained at the ceiling level of 46.06¢ a pound throughout the period, although demand was reported moderate to light. July futures, the last of the old crop, were buoyed up by price fixing and did not show the fluctuations of other futures months to so marked a degree. July futures opened the period at 45.15¢, rose to a high of 45.32¢ on May 18, declined irregularly to a low of 43.94¢ on June 11, and closed the period at 44.55¢.

Fabrics

The OPS issued CPR 37 on May 16, effective May 28, replacing the previously frozen prices for cotton fabrics and textiles with individually computed ceilings. The intention of this order is to allow producers to add to their pre-Korean prices the actual cost increases incurred up to recent dates, depending on the type of cost factor involved. Coverage of CPR 37 is broad and includes every type of cotton yarn or fabric except those containing less than 50% by weight of domestic cotton or more than 25% by weight of other fibers as nylon, rayon, or wool.

Under the order mills must individually compute the costs for each type of fabric construction and establish the most favorable ceiling price. The paper work involved is so extensive that many mills found it impossible to meet the May 28 deadline. In such cases the mills continued to accept business at lower than ceiling prices while continuing to calculate their costs.

On May 22 the cotton textile industry informally asked the OPS to apply the industry earnings standard to its prices instead of the policies contained in CPR 37. While no action was taken on the request, the industry's move was said to be based on its exceptionally favorable earnings during the earnings standard base period of 1946-1949. Under this standard any industry may ask OPS for price increases sufficient to enable it to earn 85% of the same rate of return on net worth as it had during the three best years in the base period.

CPR 37 will roll back most primary cotton textile prices from the ceiling levels permitted under the freeze period. While some fabrics such as print cloths and fine goods will rise several cents, many sheeting, drill, and heavier constructions are expected to be rolled back several cents. Ducks and other industrial fabrics will be rolled back because the prices of heavy goods were generally depressed during the base period covered by CPR 37.

A large group of mills began offering their goods for third-quarter delivery early in June, and substantial quantities of wide industrial fabrics were sold, including sateens, twills, drills, wide sheetings, headlinings, hose and belting ducks, and enameling ducks. Rubberizers claim that their purchases of ducks are being limited by insufficient rubber to meet coating needs, although they are said to be receiving 100% of their base-period supply of rubber.

An easier undertone was noted in print cloths, with scattered sales being made in spot and nearby deliveries. Inquiries for osnaburgs were reported, but actual contracts made were limited. Sheetings continued in good demand with many military orders being placed.

Cotton Fabrics

Drills				
59-inch 1.85-yd.	yd.	$0.49	/	$0.50½
2.25-yd.		.42	/	.42⅞
Ducks				
38-inch 1.78-yd. S. F.	yd.	.48⅞	/	.50¾
2.00-yd. D. F.	yd.	.445	/	.46
51.5-inch, 1.35-yd. S. F.		.645	/	.66¾
Hose and belting		.82		
Osnaburgs				
40-inch 2.11 yd.	yd.	.36	/	.37
3.65-yd.	yd.	.23		
Raincoat Fabrics				
Print cloth, 38½-inch, 64x60		.1875		
Sheeting, 48-inch, 4.17 yd.		.26⅞	/	.27¾
52-inch 3.85-yd.		.29⅛	/	.29¾
Chafer Fabrics				
14-oz./sq. yd. Pl.	lb.	.84	/	.865
11.65-oz./sq. yd. S.		.78	/	.80
10.80-oz./sq. yd. S.		.8175	/	.84
8.9-oz./sq. yd. S.		.83	/	.855
Other Fabrics				
Headlining, 58-inch 1.35-yd., 2-ply	yd.	.62		
64-inch, 1.25-yd. 2-ply		.725	/	.74
Sateens, 53-inch 1.32-yd.		.71	/	.73
58-inch 1.21-yd.		.775	/	.79⅛
Tire Cords				
K. P. std., 12-3-3	lb.	nom.		
12-4-2		.95		

Compounding Ingredients—Price Changes and Additions

Accelerator-Activators, Organic				
Emersol 110	lb.	$0.1625	/	0.175
120	lb.	.1675	/	.18
130	lb.	.19	/	.2025
210 Elaine	lb.	.1675	/	.195
Emery 600	lb.	.1375	/	.165
Hyfac 430	lb.	.1975	/	.21
431	lb.	.2075	/	.22
Dusting Agents				
Extrud-o-Lube, Conc.	gal.	1.84		
Plasticizers and Softeners				
Pigmentar	lb.	.041	/	.0655
Pigmentaroil	lb.	.041	/	.0655
Rosin Oil, Sunny South	lb.	.58		.865
Synthol	lb.	.2475		
Solvents				
Dipentene D.D.	gal.	.47	/	.68
Penetrell	gal.	.47	/	.68
Pine Oil D.D.	gal.	.755	/	.955

Correction

AN ERROR appeared in the report of the talk on "Antioxidants for Natural and Synthetic Rubbers" given by A. R. Davis, American Cyanamid Co., before the May 1 meeting of The Los Angeles Rubber Group, Inc., (published in our June issue, page 336). The sentence, "The phenols are a *new* class of antioxidants . . ." should have read, "The phenols are a *growing* class of antioxidants . . .".

United States Rubber Statistics—February and March, 1951

(All Figures in Long Tons, Dry Weight)

	February, 1951						March, 1951					
	New Supply			Distribution		Month-End Stocks	New Supply			Distribution		Month-End Stocks
	Production	Imports	Total	Consumption	Exports		Production	Imports	Total	Consumption	Exports	
Natural rubber, total	0	49,217	49,217	32,297	552	81,306	0	55,524	55,524	29,648	322	60,021
Latex, total	0	5,347	5,347	5,275	0	5,936	0	7,380	7,380	5,687	0	7,291
Rubber and latex, total	0	54,564	54,564	37,572	552	87,242	0	62,904	62,904	35,335	322	76,312
Synthetic rubbers, total	*50,565 †5,850	1,267	57,682	53,308	615	59,035	*59,799 †5,487	1,152	66,438	65,587	526	60,614
GR-S types‡	†45,206 †899	1,017	47,122	43,102	4	43,395	*54,152 †6	815	54,973	53,977	17	44,691
Butyl	*5,359	250	5,609	5,460	0	7,519	*5,647	337	5,984	6,003	0	7,890
Neoprene‡	†4,090	0	4,090	3,743	468	5,495	†4,225	0	4,225	4,517	432	5,221
Nitrile types‡	†861	0	861	1,003	143	2,626	†1,256	0	1,256	1,090	77	2,812
Natural rubber and latex, and synthetic rubbers, total	56,415	55,831	112,246	90,880	1,167	146,277	65,286	64,056	129,342	100,922	848	136,926
Reclaimed rubber, total	30,402	100	30,502	28,792	1,629	36,885	35,094	200	35,294	32,678	1,475	38,334
GRAND TOTALS	86,817	55,931	142,748	119,672	2,796	183,162	100,380	64,256	164,636	133,600	2,323	175,260

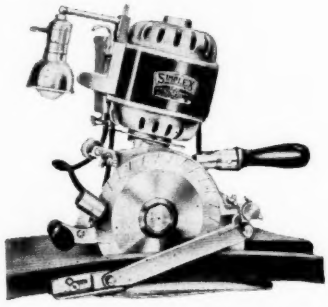
*Government plant production.
†Private plant production.
‡Includes latices.
SOURCE: Rubber Division, NPA, United States Department of Commerce, Washington, D. C.

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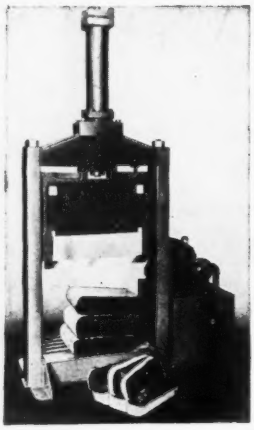
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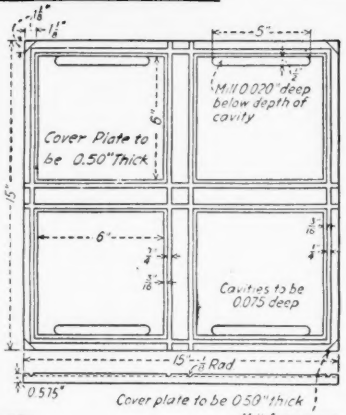
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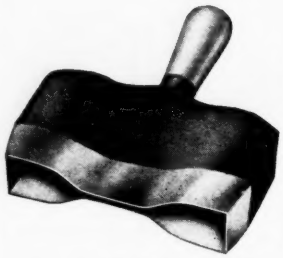
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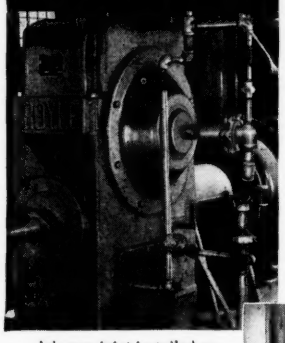
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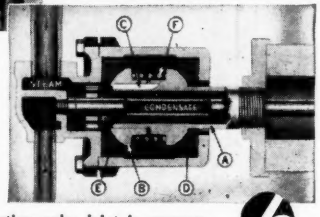
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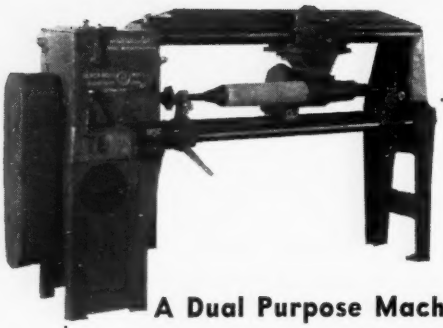
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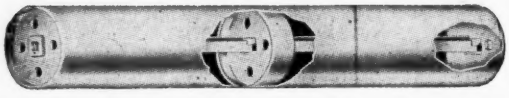
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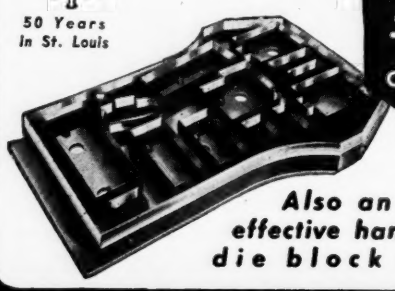
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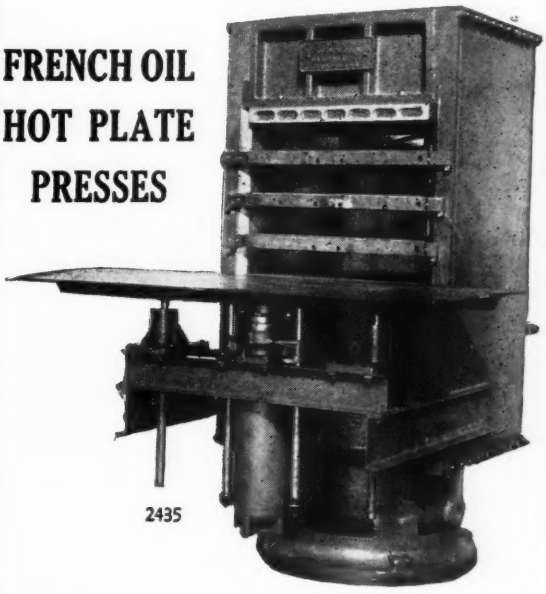
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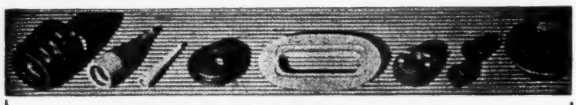
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